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STEEL

The Magazine of Metalworking and Metalproducing

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Give a *master* mechanic new, up-to-date tools, and you can expect master workmanship. And when Crucible, *master* producer of tool, alloy and specialty steels, designs an $18,000,000 mill specifically for hot and cold rolled stainless sheet and strip, you can rightly expect the best that modern facilities and generations of *specialty product* leadership can provide. Stainless is made a *specialty product*, by specialty production methods, in this *all-new mill* at the Midland Works—in widths from ½″ to 50″ inclusive, and in all gauges, grades and finishes.

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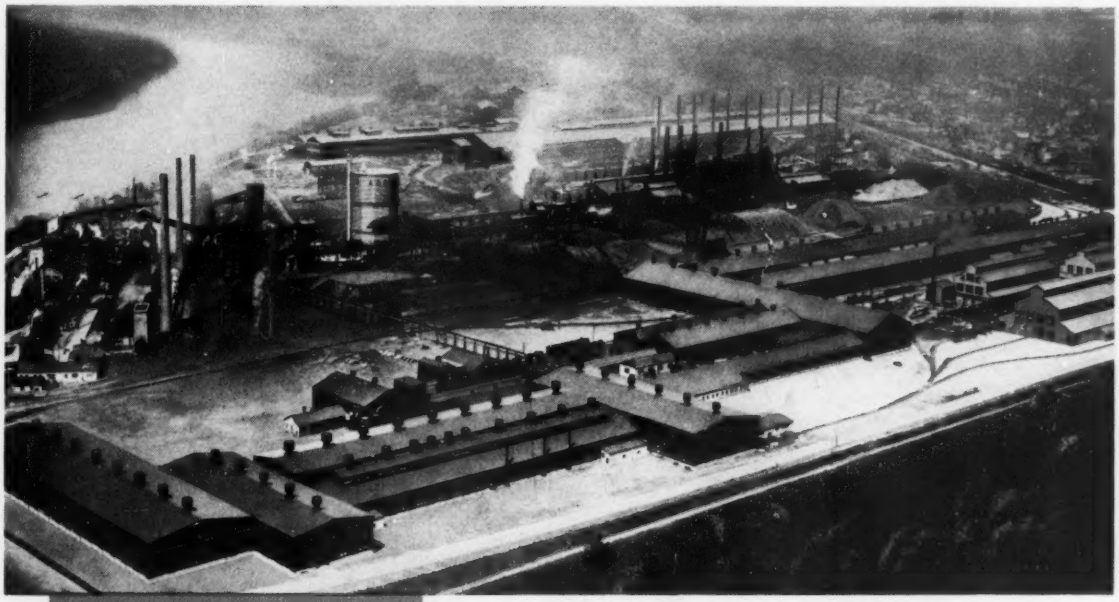

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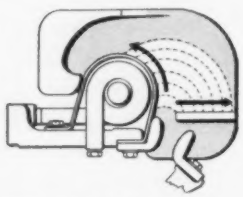

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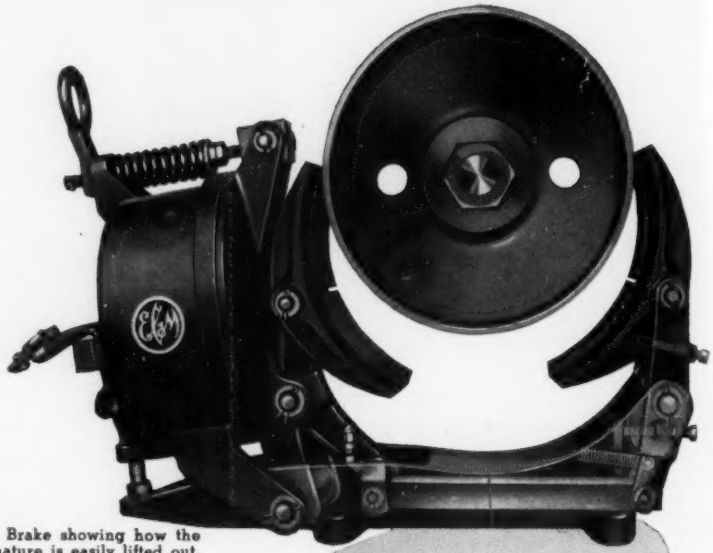
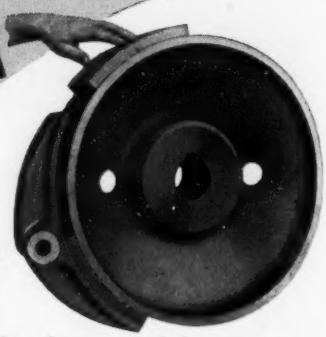
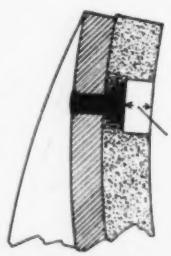


Type WB Brake showing how the motor armature is easily lifted out. At top left is the handle-nut for compressing the spring when removing motor armature, changing brake shoes, and for manual control.

Long Life Brakes for A-C and D-C Motors by EC&M



The brake lining is molded to match curvature of wheel and shoe.



Actual wearing thickness, between rivet heads and brake wheel, is 1/8 inch on the smallest size to 1/2 inch on the largest size.

These Type WB Brakes for a-c and d-c service have a block type lining which is both thick and tough.

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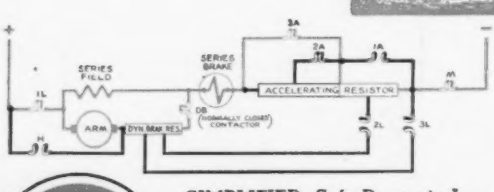
EC&M Type WB Brakes are built in several sizes. Send for Bulletins 1004 and 1006.



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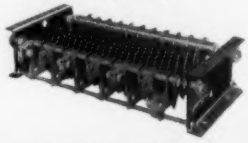

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Gage Equipped Shears Produce Accurate Blanks without Dies

Ingot to Coiled Hot Strip In Six Minutes

STEEL

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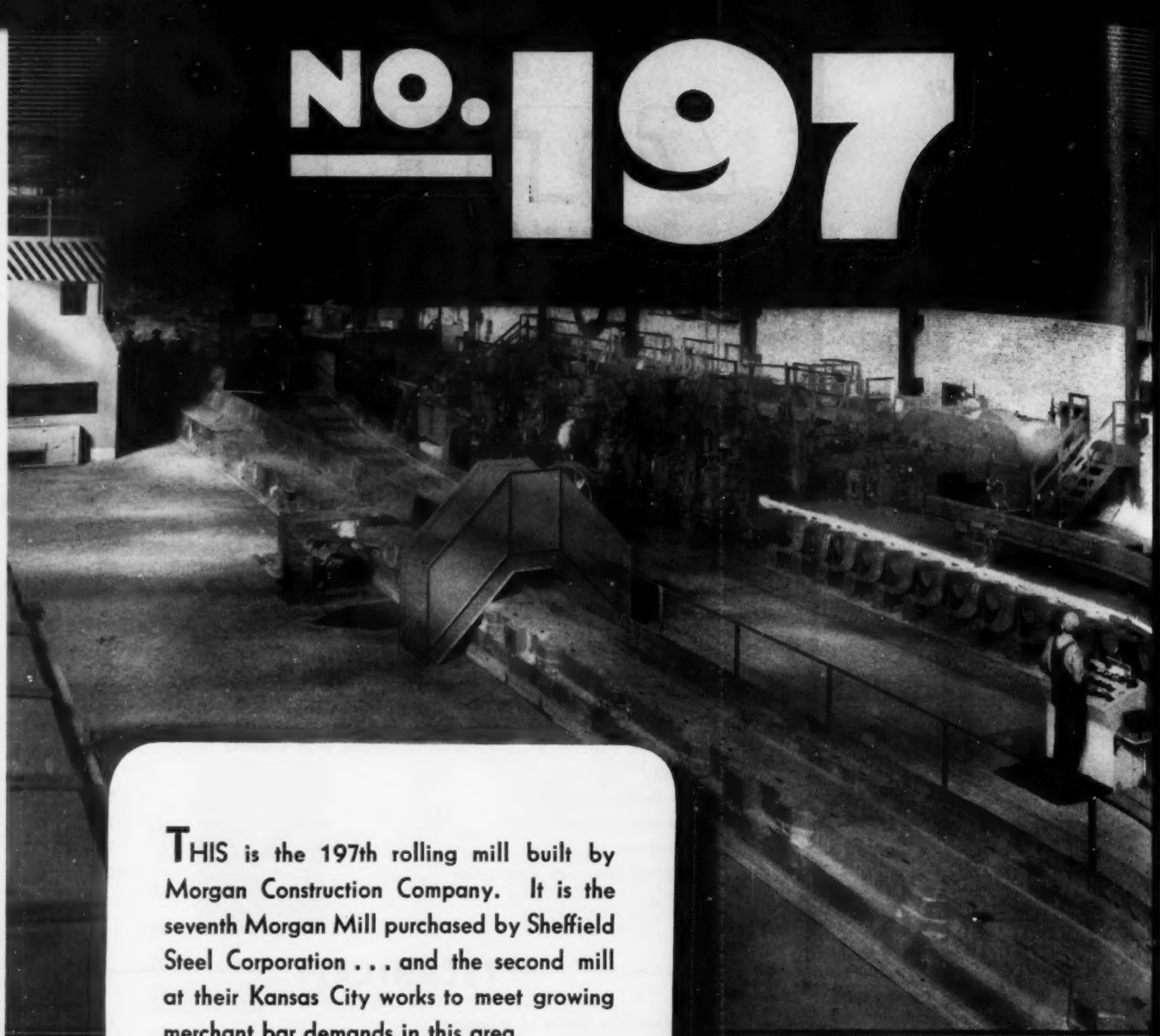

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July 18, 1949

The Public and Strikes

Almost everything that happened last week in connection with the threatened steel strike pointed to the fact that the union leaders and the government were banking on public opinion to help them win some concessions from the steel companies.

Whether a fact finding committee works under the informal request of President Truman or under the legal provisions of the Taft-Hartley Act probably would make little difference in the findings of that committee. Doubtless the union leaders figured that a three-man board, sitting under either of these authorizations, would hand down recommendations that would be more favorable to the unions than anything the unions could gain by direct negotiation with the steel companies. Although in either case the recommendations would not be binding upon employers or unions, the union chiefs were hopeful that the weight of public opinion behind the board's findings would be strong enough to induce the steel companies to grant concessions.

Time and circumstance will determine whether or not Mr. Murray and his associates were justified in this expectation. However, there is one important factor that sooner or later will have a bearing upon this and all future strikes or threatened strikes. That factor is the growing realization by people all over the world that too much power in the possession of unions and governments working in collusion is dangerous and destructive.

Right now Hawaii is at the mercy of a strike which has paralyzed the islands. If the threatened steel strike did not constitute an emergency acute enough to justify use of the Taft-Hartley Act, as President Truman claims, the Hawaiian situation certainly justifies such action; yet the President refuses to act. In England, the rebellion of dock workers against a Labor government of their own choosing emphasizes again the peril of too strong a coalition between state and unions.

The fact that in Honolulu, as in London, Communist influences are blamed increases rather than lessens the government's responsibility for protecting the public interest.

Should the Hawaiian and British situations worsen during the next few weeks, American public opinion may not be in a mood to be overly sympathetic to a settlement of the steel issues that is unduly favorable to the unions.

* * *

ECONOMICS BY TRUMAN: President Truman's belated conversion to the realities of the present economic situation proceeds slowly. In his "economic" message last week he gave up more or less gracefully his often repeated demand for a $4 billion increase in taxes and his request for numerous standby controls to combat inflation. He acknowledged the existence of a "moderate downward trend" and proposed an 11-point program to combat it.

Almost as interesting as his about-face on taxes and controls was his labored attempt in his radio address Wednesday evening not only to justify a terrifically high national budget but to criticize severely those who favor economy in government. It was obvious from his remarks that he continues to pursue two grave fallacies.

One is his failure to see the difference between a government job and a private job. Apparently he thinks a government job has the same economic value as a private job. In reality the former is a burden supported by the latter.

The other fallacy is in regard to taxes. He doesn't seem to understand that high taxes—

(OVER)

amounting to more than 25 per cent of national income—discourage the very industrial and economic expansion which he says he favors strongly.

The most amazing part of his talk was his criticism of persons seeking economy in government. This, of course, condemns about 75 per cent of the members of his own party in Congress. —p. 53

* * *

METALS TREND UPWARD: Nonferrous metal markets are extremely sensitive to changes in overall business conditions. For this reason, the present reversal of trend in prices and demand for copper and lead will be watched closely for clues to possible changes in business generally.

From 21.35c last November, lead declined steadily to a low of 11.85c in May, and recently rose from that figure to 13.85c. From 23.50c last March, copper declined to 16.00c, from which it has risen in two jumps to 17.62½c. The upturn in the prices of both metals has been accompanied by a marked improvement in buying.

While government stockpiling and curtailment of mining operations figure in this situation, a more important factor is the reduction of fabricators' and manufacturers' inventories which has resulted from restricted hand-to-mouth buying in recent months. The interesting question is whether or not inventories in lines other than nonferrous are nearing the point where a resumption of freer buying will be necessary.

—pp. 53, 143

* * *

ZINC-PROTECTED STEEL: Several decades ago there were frequent arguments in regard to the thickness of the coating of zinc on galvanized steel wire, sheets and tubes. Some customers, particularly farmers, sometimes complained that the mills were skimping on the amount of zinc applied to the steel.

During the intervening years much has been learned about the life of zinc-protected steel and the methods of manufacturing have been improved greatly. Today, by means of either the hot-dip or electrolytic process, producers are able to supply customers with galvanized products which will meet the requirements of a wide range of corrosive conditions. For instance, depending upon the thickness of coating, sheets can be purchased that will last from 1 to 15 years in an industrial atmosphere or from 5 to 50 years in a rural atmosphere.

The seventh installment of Charles L. McGranahan's article on "Hot and Cold Rolled formation on galvanized flat rolled products. Strip and Sheets" is replete with important information on galvanized flat-rolled products.

—p. 91

* * *

REASSURANCE IN EUROPE: In the face of Britain's deteriorating economic situation, some countries in Western Europe find reasons for moderate optimism.

In France, continuation of the decline in the cost of living and other favorable indicators prompt President Auriol to say that "the franc is consolidating from day to day and our country is decidedly recovering its health and life." Belgium and Luxemburg exult in the fact that the Benelux Union is the only creditor nation among ERP countries. Italy, worried by its business recession, finds welcome distraction in the discovery of oil in the Po valley.

Even in Bizone Germany, industrialists are beginning to hope that expanding credit and improved investment in plant and equipment "will counteract the slight depression." Six German companies are producing passenger cars in 13 models, the prices of which are declining. —p. 63

* * *

A WAY TO SAVE TIME: Although adequate systems of communication are taken for granted as a necessity in today's complicated economy, industry has been somewhat negligent in adapting to its needs facilities which have been tested and proved sound by power, gas, telephone, taxicab and other service companies. These utilities have improved their service appreciably by means of radio telephones, which enable trouble shooters and others in the field to keep in touch with a central office.

Today a number of industrial companies are beginning to profit from the experience of these utilities. By installing two-way voice communicating devices energized by trolley wires or power plant lines, operators of soaking pit and electric furnace cranes, ore bridges, unloaders, transfer cars, coke oven pushers and similar machines can be in constant telephonic communication with the men who need their services. The result is a marked reduction in lost time.

Do not overlook efficient communication when seeking economies in a buyers' market!

—p. 86

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

BUSINESS WEATHER—Industrial activity continues to trend downward, with mass vacations in many plants accenting the drop. However, some faint signs of an upturn can be discerned (p. 53). A few foundries report an increase in orders. Copper and lead prices have turned upward after undergoing sharp declines since March. The increases reflect better demand as well as substantial government stockpiling requirements, depleted inventories and too-sharply curtailed production. Scattered instances of more generous buying policies appear after weeks of hand-to-mouth purchasing. In part, this is ascribed to fear of work stoppages in suppliers' plants.

SETTLEMENT DELAYED—Presidental intervention in the steel labor dispute is seen delaying final settlement for at least 60 days, or until sometime after the fact-finding board reports on the issues (p. 55). In intervening, the Chief Executive chose to bypass the Taft-Hartley act procedures, a move resented and protested by the steel companies . . . . Workers for a tool and drill company have accepted (p. 55) a 20 per cent reduction in base wages . . . . United Auto Workers (p. 56) will attempt to shed its cost-of-living clause contracts . . . . Inland Steel (p. 56) has offered workers a contributory insurance and pension program, but the union has refused to accept.

ANTITRUST STUDY—A full-scale and long-term investigation of antitrust laws and the need for plugging loopholes in them is under way in Washington by a House Judiciary subcommittee (p. 60). The study will bring the Temporary National Economic Committee study up to date, and will be devoted particularly to changes wrought by the war.

PRICING BILL—The O'Mahoney freight absorption bill awaits Senate action, after House passage in a form different from the upper chamber's version (p. 58). Debate on the bill in the House was marked by frequent references to communications from business organizations favoring the legislation.

RECORD OUTPUT—Steel production in the first six months of 1949 reached an alltime record of 45,928,476 tons of ingots and steel for castings (p. 57). Output in June dropped a million tons from May and was the lowest for any month since April, 1948.

AUTOMOBILES—Brightest spot in the industrial pictures continues to be the automotive industry, where production continues at high levels, despite sporadic labor disputes. New steel-top sports models are being offered by a number of builders (p. 68). Chrysler quietly has made some changes in suspension systems and trim to lower the height of its 1949 models (p. 67). Ford is planning a major die-casting equipment installation (p. 67).

FOREIGN—Economic crisis in Great Britain has focussed attention on the condition of other Marshall Plan countries (p. 63). France says its economic life is improving, although still plagued by high living costs. Western Germany is less gloomy. Belgium and Luxemburg iron and steel exports are holding up well. Discovery of oil in the Po river valley has given a fillip to Italy's economy.

HERE AND THERE IN INDUSTRY—Reynolds Metals Co. has taken a six-month option to purchase control of Southern States Iron Roofing Co. (p. 70) . . . Electricity consumption in rural areas has nearly doubled in the past two years (p. 62) . . . Study of steel distribution will be revived (p. 60) by the House Small Business Committee . . . . Horton Mfg. Co. has purchased the home laundry division of F. L. Jacobs Co. (p. 70) . . . Nash will open a new plant in Toronto (p. 68) . . . Lustron Co. has reached a production level of 24 homes a day (p. 65), expects July output to be 50 per cent higher . . . Fishing equipment production is holding near the peak of the past two years (p. 59).

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Metals Price Trend Reversed

Advances on copper and lead accompany renewal of buying interest after months of sluggish demand. Reduction in fabricators' inventories important factor

BUSINESS in general still tends toward the downside, but here and there signs have been appearing over the past several weeks indicating that the downswing possibly has become over-extended in some directions.

This is especially true with respect to inventories of certain raw materials. Some consumers appear to have permitted stocks to fall below the safety point. As a result, they are being compelled to adopt more generous buying policies after months of hand-to-mouth purchasing. Broader participation in the market by consumers generally is expected once vacation periods are out of the way.

Metals Advance — Probably the most important development in the raw material markets the past several weeks has been the renewal of buying interest and accompanying display of price strength in copper and lead. Because of the sensitiveness of the nonferrous metals to business conditions, developments in these markets are being watched closely for a clew to a possible change in overall business sentiment.

Over the past two weeks, copper and lead prices have advanced rather sharply after months on the downtrend. Copper rose from 16.00c per pound to 17.62½c delivered Connecticut, and lead from 11.85c to 13.85c St. Louis, in less than a week. The rise in copper marked the reversal of a downtrend that started in March when the metal was quoted at 23.50c. Lead started to decline last November when it was quoted 21.35c St. Louis. Late in May it struck a postwar low of 11.85c. Price trend of the two metals over the past year is shown in the accompanying graph.

Accompanying the upturn in the primary metals, brass and copper products have responded correspondingly. While zinc prices have held unchanged, since mid-June some improvement in buying of this metal has been noted.

Stronger Demand—Various factors have contributed to the stronger lead and copper markets. Demand has been improving noticeably over past weeks. Bearing importantly on the situation has been the reduction of fabricators' and manufacturers' inventories resulting from the hand-to-mouth buying of the past several months. At the same time government requirements for stockpiling have been made known and will be substantial over coming months.

Further, mine production of the metals has been curtailed and it is reported supplies of scrap have been pretty well liquidated. Custom copper smelters, who have been the chief suppliers over past months with large mine producers holding out of the market and quoting higher prices, have been receiving inquiry in excess of their daily intake of ore and scrap. With the advance of the custom price to 17.62½c, however, the mine producers again are actively participating in the market. These mine producers hold large stocks so that it is possible the advance in copper may be halted for the present.

In the case of lead, sellers have been experiencing a revived demand from the electric storage battery trade which absorbs about 40 per cent of total lead supply. Also contributing to strength in lead is the fact that the import duty of 1-1/16 cent a pound on foreign metal was reinstated at the beginning of this month.

Foundries See Hopeful Signs

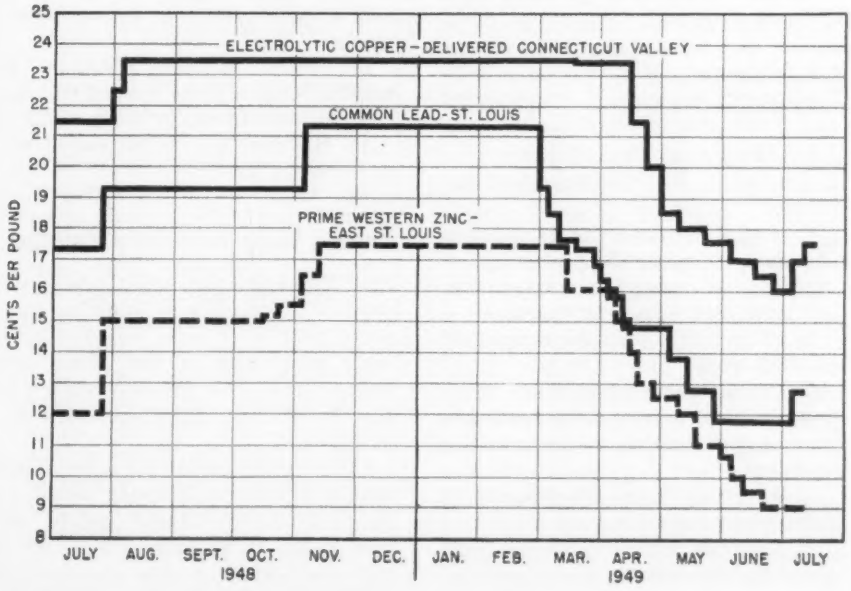
SCATTERED signs of improvement have appeared in the foundry industry but not to the extent any major reversal in overall castings demand appears in the offing. Automotive demand for castings is providing substantial support to some shops. Some gray iron and malleable foundries are reported to have made purchases of pig iron to cover requirements in event of a steel strike but there is no frantic scrambling for iron. Foundry operations currently are restricted by vacation shutdowns.

Gray iron castings buyers, surveyed by the Gray Iron Founders' Society as to the amount of business they will give foundries the remainder of this year, report varied prospects. Some expect their purchases to be around 1948 levels while others say, their 1949 buying will be off 40 to 50 per cent. In the aggregate the foundries expect their operations will be off 15 per cent this year from 1948 levels.

Book New Orders—A few malleable foundries engaged in general work have booked new orders from customers who have been out of the market while working off inventories. Their operations, however, have been slow in recent months and the scattered orders are not enough to raise the industry's rate appreciably.

Operations in the steel foundries

Price Trend on Leading Nonferrous Metals



are averaging about three days a week although some shops' specialty lines are working at nearly a normal rate.

The foundry equipment orders index compiled by the Foundry Equipment Manufacturers Association, Cleveland, dropped to 121.9 per cent of the 1937-1939 average in May, low point for the postwar period. Dollar volume of orders was $564,814, compared with $1,914,591 in May, 1948.

Truman Recognizes Downtrend

FACING up at last to the economic dip of the last six months, President Truman last week recognized the "moderate downward trend" in business activity and jettisoned his demands for a $4 billion tax increase and other anti-inflation proposals.

In their stead, the Chief Executive proposed an 11-point program to combat the recession.

The latter includes deficit financing to maintain public works, farm supports and foreign aid programs.

Mr. Truman's conversion to the recession school was temperate. "Our economy is still operating at high levels of employment and production," he reported to Congress. The present situation does not warrant "the kind of government action that would be called for in a serious economic emergency."

Outlook Reassuring — Taking his cues from the midyear report of his Council of Economic Advisers, which found the business outlook reassuring, Mr. Truman spoke out against wage cuts, but called for price reductions.

What is needed, he said, is increased production. He suggested a $300 billion annual volume as a goal.

"We cannot have prosperity by getting adjusted to the idea of a depression—by cutting investment or employment or wages or essential government programs. We can be prosperous only by planning and working for prosperity, by increasing private investment, production, employment and purchasing power."

His Program—The 11 point program asked by the President includes:

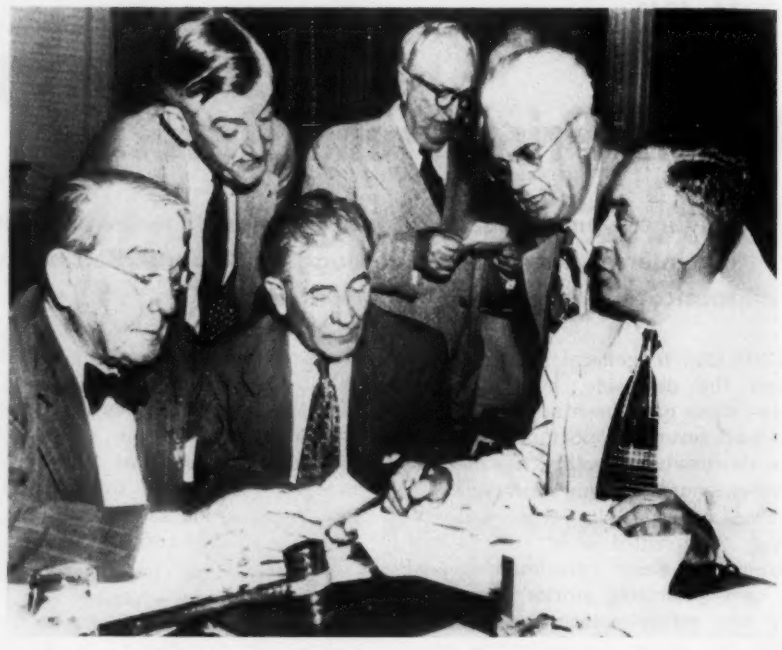
1. Repeal the tax on transportation of goods, liberalize the provisions for carryover of losses by corporations, and raise estate and gift taxes.

2. Extend time limit for repayment of RFC loans.

3. Provide for a broad study of investment and development needs and market opportunities in an expanding economy.

4. Adopt an improved program of farm price supports.

5. Increase minimum wages to 75 cents and broaden its coverage.



VOTE ERP FUNDS: Senate Appropriations Committee last week voted $3,778,000,000 in new spending power for the European Recovery Program, a figure just 10 per cent under President Truman's budget request. Members of the committee, left to right: Senators Kenneth McKellar, Everett Saltonstall, A. Willis Robertson, Pat McCarran, Homer Ferguson and Styles Bridges. NEA photo

6. Strengthen the unemployment compensation system by increasing the amount and duration of benefits and extending coverage.

7. Extend for one year the availability of readjustment allowances for veterans not protected by state unemployment compensation laws.

8. Raise benefits and extend coverage under the old-age and survivors insurance system and improve the public assistance program.

9. Enact legislation to permit federal agencies and assist states and localities to intensify advance planning and acquire sites for future public works.

10. Provide technical assistance to underdeveloped areas abroad and encourage investment in those areas.

11. Restore the reciprocal trade agreements act.

Expect Early Inventory Balance

FASTER deliveries, lower prices and smaller inventories in June as compared with May were reported by a large proportion of the firms covered in the latest monthly survey of the Purchasing Agents Association of Chicago.

Over 80 per cent of the respondents indicated their inventories would be in satisfactory balance before the end of the third quarter and only 9 per cent expected this condition to be delayed until after the first of next year.

Trend toward a 30-day or less buying policy continued in June.

New England Business Better

EIGHTEEN per cent of 196 reporting firms members of the New England Purchasing Agents Association report business was better in June than in May. New orders were higher at 28 per cent of the companies in June against 17 per cent in May. Employment also was higher at 10 per cent of the firms in June whereas none had reported an increase the preceding month. Buying policy was still conservative with 27 per cent of the companies operating on a hand-to-mouth basis, 37 per cent being covered for one month and 31 per cent for two months.

May Reopen Some Closed Plants

WHILE American Radiator & Standard Mfg. Corp. sales in the first half of this year are estimated down about 17 per cent from the like period a year ago, sales decline is attributed to reduced construction, inventory reduction and hand-to-mouth buying.

Theodore E. Mueller, president, states the company may reopen some of its closed plants before yearend.

Intervention Delays Steel Settlement

Appointment of fact-finding board seen precluding final settlement for at least 60 days. Industry holds President should follow procedure set forth in Taft-Hartley Act

FINAL settlement of the steel labor dispute appears to have been delayed at least 60 days by the decision of President Truman to appoint a fact-finding board, outside the Taft-Hartley act.

During the period that the President's board of inquiry is studying the steel dispute, it is unlikely that any effective negotiations will be conducted by the companies and the union. The union in particular will want to await the report of the fact-finding board.

Ignore Taft-Hartley Procedure — After efforts by Conciliation Chief Cyrus Ching to effect a settlement had failed, President Truman announced he would appoint a fact-finding board to study the dispute and to make recommendations for its settlement within 45 days. He asked leading steel producers and the union to continue operations for 60 days, pending report by the board.

In setting up the fact-finding board empowered to make recommendations for settlement of the dispute, the President chose to disregard the procedure outlined in the Labor Management Relations (Taft-Hartley) Act of 1947 for handling threatened strikes of a national emergency character. The President and the unions unsuccessfully have sought repeal of the act and it is believed this influenced his decision to disregard the law.

Companies Demur — U. S. Steel, Bethlehem, Republic and other large steel producers pointed out that a procedure for handling threatened strikes was contained in the law and that this procedure should be followed by the President. They pointed out that fact-finding boards appointed under the Taft-Hartley act do not have the power to make recommendations. They declined to accept the recommendations that might be made by the President's board and urged that the Chief Executive follow the law of the land as prescribed by Congress.

Union Authorizes Strike — Meanwhile the United Steelworkers-CIO had authorized a strike to start at 12:01 a.m. July 16. When news of the President's intervention was received, the strike authorization was amended to apply only to those companies which refused to accept the President's fact-finding board.

Argument Over Words—Then developed a rather thin argument over what constituted acceptance or rejection. Statements by the large steel companies were in similar vein. They were willing to continue operations. They believed that the President should follow the procedure outlined in the Taft-Hartley act in establishing a fact-finding board. They refused to accept as binding the recommendations of the President's board.

The President decided that U. S. Steel, Bethlehem and Republic had rejected his proposal. He interpreted replies by Jones & Laughlin, Wheeling and Youngstown Sheet & Tube as being acceptances.

The union decided that the first three companies should be struck. The companies whose replies were interpreted as acceptances would not be struck.

Telegrams then were sent to 53 other steel companies asking them to go along with the President's plan. Some accepted. Some rejected the proposal. Some said they were not affected because their contracts expired at a later date.

Inland Steel and the union on Thursday negotiated a 60-day extension to their contract, but this was canceled later the same day because the union held that the company's acceptance of the President's proposal was not complete enough.

Blast Furnaces Banked — As the strike deadline approached, U. S. Steel and other companies threatened by the strike began to bank blast furnaces and otherwise prepare for a shutdown.

Workers at several steelmaking centers received the strike call with open reluctance. Nearly 100 employees of U. S. Steel at Braddock, Pa., communicated their dissatisfaction to local newspapers.

WORKERS TAKE CUT

A 20 per cent reduction in base pay rates has been accepted by employees of the Avildsen Tools & Machines Inc., New York and Chicago. A few days after the reduction was put into effect, Avildsen workers rejected an attempt by the United Steelworkers of America-CIO to unionize their plants by an 83 per cent majority.

The pay reduction was necessitated by the company's high break-even point, Chairman Clarence Avildsen explained to employees. While wages have advanced 90 per cent since 1937, the selling price of the company's products have advanced only 29 per cent. The company recently has been operating at a loss as result of a drop in volume.

If the company makes a profit under the reduced pay scale, 100 per cent of such profits will be returned to employees in salary recovery bonuses, Chairman Avildsen promised.

Nathan Steel Report Hit

Company executives discount study made on behalf of United Steelworkers-CIO

HOOTS OF DERISION from steel company executives greeted the Nathan report on the economic position of the steel industry, issued last week on behalf of the United Steelworkers-CIO.

The study was prepared by Robert N. Nathan, formerly an official of several wartime government agencies, and more recently retained by the CIO to prepare studies to support the union's demands for wage increases. The current study purports to be "a survey of facts for wage negotiations" prepared for the union.

Claims Refuted—Mr. Nathan contends the steel industry could raise wages, reduce prices and still make excellent profits.

He contends that the break-even point of the steel industry under present wages, prices and materials costs is 32 per cent of capacity, compared with 35 to 45 per cent of capacity before the war.

Steelmakers contend today's break-even point is considerably higher than prewar.

The Nathan claim of a 32 per cent break-even point is characterized by Frank Purnell, president, Youngstown Sheet & Tube Co., as "ridiculous but in keeping with other erroneous presentations by him."

Parallels Union's Own Study — The Nathan report is similar to another study released last week by the union and made by the union's own research department under the direction of Otis Brubaker, research director. The union report states steel profits are excessive, that steel price increases have outrun steel wage increases, that productivity per man-hour has increased,

and that the industry's return on invested capital is unwarrantedly high.

The union's study concludes that the steelworkers need an increase and that "the steel industry can well afford to grant such an increase without raising steel prices." Furthermore, the union says, "the industry can grant a wage increase and still lower its prices."

Nathan on Breakeven Point—The Nathan report essays to set up breakeven points for the industry under varying conditions. Starting with the 32 per cent figure under June conditions, Mr. Nathan estimates that a 10-cent hourly wage increase would lift the break-even point to 36 per cent; a 15-cent increase would raise the break-even point to 39 per cent; and a 20-cent increase would make the break-even point around 42 per cent.

Industry officials declare the current break-even point is far above the figures set forth by Mr. Nathan, although even an approximate figure for the industry is extremely difficult to determine.

Unrealistic Guess—Says Charles R. Hook, chairman, Armco Steel Corp., Middletown, O.: "In the case of major steel companies there are no published figures available to anyone, either for an individual company or the industry, which would make possible the calculation of a break-even point on steel operation. In all such cases published results cover consolidated operations which include railroads, utilities, shipbuilding, fabricating, warehousing, mines, real estate, and miscellaneous operations, on most of which capacity cannot be determined, thus making impossible a break-even calculation.

"In our opinion, Nathan's statement is based on pure guess and is completely unrealistic."

Inland Offers Pension Plan

INLAND Steel Co. has offered the United Steelworkers a contributory pension and social insurance plan, estimated to cost the company $3 million annually, or 10 cents an hour per employee.

The plan was rejected by the union which is asking for a program financed entirely by the company and for larger benefits than contained in the company's proposal.

The Inland pension plan offers to match federal social security for employees who retire with 20 years or more service by guaranteeing a minimum pension equal to the amount of primary federal social security benefits.

For the average Inland worker, who earns $3875 annually, this would mean a pension of $163 a month, including social security, after 35 years of participation in the program. The plan provides for compulsory retirement at age 65. The union had asked that retirement be on a voluntary basis.

Under the insurance program offered by the company, the average employee would be entitled to $5500 group life insurance, nonoccupational accidental health benefits of $35 a week for 13 weeks and hospitalization insurance for worker and dependents of $5 a day. In addition, a maximum of $50 was offered for additional hospital fees and $200 for surgical expense.

Inland is under a National Labor Relations Board order, upheld by the Supreme Court, to bargain with employees on its pension plan.

UAW To Drop Escalator Clause

WAGE escalator clauses in labor contracts, as exemplified by the General Motors-United Auto Workers-CIO agreement, are opposed by the union and will be dropped when the GM contract expires next May.

This was made clear last week by Walter Reuther at the Milwaukee convention of the UAW.

The agreement hitching wage rates to the cost-of-living index was an expedient accepted by the union last year after organized labor had met many rebuffs in their demands for third round wage increases. When General Motors offered the escalator clause, the union figured it was the first break in united opposition by industry to wage increases and accepted. Later they were able to wrest straight wage increases from the steel, electrical and other industries.

Cleveland Employment Improves

EMPLOYMENT in Cleveland showed a small net gain in June largely because of the recall of 1400 workers at auto parts plants who were idle in May during the Ford strike. The survey conducted by the Cleveland Chamber of Commerce covers 100 representative manufacturing plants which had 98,290 employees on payrolls as of June 27, a gain of 0.8 per cent over a month earlier. Estimate of total manufacturing employment for June was 211,400 compared with 187,500 in May.

According to the chamber, the underlying employment trend seems to be a continuation of the slow downtrend in evidence since December. During June, 53 of the plants surveyed showed employment declines as compared with 32 which expanded forces.

The index of employment based on the 1939 average as 100 stood at 150.3 at the end of June and 149.1 at the end of May. Postwar high of 175.3 was reached in March, 1947 and the low of 139.7 in September, 1945.

Lone Star Steel Gets RFC Loan

LOAN of $34 million to the Lone Star Steel Co., Dallas, Tex., last week was approved by directors of the Reconstruction Finance Corp. It will be used to assist in acquiring and installing finishing facilities at the company's plant for the production of electric weld steel line pipe and oil well casing.

Conditions of the loan require that the company invest $22 million in expanding its facilities prior to disbursement of the RFC loan and in addition provide working capital of not less than $4 million.

Steel Hauling Study Pushed

SAFE loading of steel on motor trucks now is on the active agenda of the Interstate Commerce Commission.

ICC's Bureau of Motor Carriers, at a meeting July 7, told representative steel shippers, haulers and motor vehicle manufacturers the best procedure was for them to agree on a comprehensive code for safe loading of steel and safe transportation on the highways. Unless the industry agrees on a voluntary code, the meeting was informed, the ICC will launch its own study for the purpose of establishing mandatory regulations.

The ICC position is that although motor truck transportation is subject to state regulations stipulating maximum axle loads, etc., the ICC has the authority to insist that trucks must be loaded safely and must be able to come to a stop, when fully loaded, in a given number of feet. Discussion at the meeting centered on the means by which safe loading of steel can be accomplished, particularly by the use of vehicles of proper design.

The whole problem was put in the lap of a subcommittee which will hold a further conference at the Hotel Cleveland, in Cleveland, July 18 and 19, and which then will report to the Bureau of Motor Carriers and all those who attended the initial July 7 conference. Until this report is received, the ICC will stay its hand, in order to give all interests concerned with steel transportation on the highways full opportunity to draft a voluntary code.

Record Steel Production

Output in first six months is best ever reported. June total down sharply

DESPITE a decline of more than 1 million tons in June, a total output of raw steel in the first six months this year established a new all-time record for that period at 45,928,476 net tons, according to the American Iron & Steel Institute, New York. This represented an increase of 2,810,433 tons over the total for the like 1948 period.

Production in June, amounting to 6,501,332 tons, was the smallest for any month since April, 1948, and was nearly 1,900,000 tons under the record output of 8,387,927 tons for March.

Average Rate Down—Steelmaking furnaces were operated in June at an average of 82.2 per cent of capacity. This was the lowest monthly rate since April, 1948, when 80.5 per cent was recorded. It was 10.7 points lower than the May average and 20.5 points lower than in March. For 10 consecutive months prior to June, operations had averaged above 90 per cent of capacity and they now have declined for three consecutive months.

In the half-year, steelmaking furnaces were operated at an average rate of 96.3 per cent of capacity against 92 per cent of capacity in the first half of last year.

Production during the second quarter of 1949 totaled 21,876,330 tons, compared with 21,070,378 tons in the like 1948 period. Steelmaking furnaces were operated at an average of 91.2 per cent of capacity during the second quarter of this year against 101.5 per cent during the first quarter and 89.9 per cent in the like period a year ago.

Palm Oil Substitute Tested

SYNTHETIC substitute for African and East Indian palm oil, vital in making hot dip tin plate, will be given mill tests soon. Research scientists at Armour Research Foundation of Illinois Institute of Technology report successful laboratory tests which might have wide economic importance in the steel industry. There is no domestic source for the oil; 7500 tons are used annually in the U.S.

Combined Shipments Record Hit

COMBINED shipments of ore, coal and grain on the Great Lakes in the season to date is greater than any like period by nearly 400,000 tons. Iron ore shipments of 13,621,802 net tons in June were exceeded only in 1942 when 14,140,114 net tons were shipped. Ore shipped to July 1 of this year, 37,167,838 net tons, was slightly below comparable 1942 shipments. Coal shipped to July 1, 17,986,271 tons, was exceeded only by 1942 shipments. However, grain shipments of 4,196,742 tons were the highest since 1945.

Steel Ingot Production Statistics

	Estimated Production—All Companies								Calculated weekly production Net tons	Number of weeks in mo.
	Open Hearth		Bessemer		Electric		Total			
	Net tons	Per Cent of capac.	Net tons	Per Cent of capac.	Net tons	Per cent of capac.	Net tons	Per cent of capac.		
1948										
Jan.	6,770,831	95.6	343,263	77.5	366,784	80.2	7,480,878	93.7	1,688,686	4.43
Feb.	6,247,491	94.4	340,689	82.3	359,837	84.2	6,948,017	93.1	1,678,265	4.14
Mar.	6,845,777	96.6	363,334	82.0	409,659	89.6	7,618,770	95.4	1,719,813	4.43
1st qtr.	19,864,099	95.5	1,047,286	80.6	1,136,280	84.7	22,047,665	94.1	1,695,974	13.00
Apr.	5,640,273	82.2	185,140	43.2	399,074	90.1	6,224,487	80.5	1,450,929	4.29
May	6,801,633	96.0	355,659	80.3	423,350	92.6	7,580,642	94.9	1,711,206	4.43
June	6,484,114	94.5	356,907	83.2	424,228	95.8	7,265,249	94.0	1,693,531	4.29
2nd. qtr.	18,926,020	91.0	897,706	69.0	1,246,652	92.8	21,070,378	89.9	1,619,552	13.01
1st 6 mos.	38,790,119	93.3	1,944,992	74.8	2,382,932	88.8	43,118,043	92.0	1,657,749	26.01
July	6,348,611	89.8	325,080	73.6	401,826	88.1	7,075,517	88.8	1,600,796	4.42
Aug.	6,633,443	93.6	371,306	83.8	442,085	96.7	7,446,834	93.3	1,681,001	4.43
Sept.	6,594,499	96.3	387,259	90.5	443,086	100.3	7,424,844	96.2	1,734,777	4.28
3rd. qtr.	19,576,553	93.2	1,083,645	82.6	1,286,997	95.0	21,947,195	92.7	1,671,530	13.13
9 mos.	58,366,672	93.2	3,028,637	77.4	3,669,929	90.8	65,065,238	92.2	1,662,372	39.14
Oct.	7,120,753	100.5	409,657	92.5	466,485	102.0	7,996,895	100.1	1,805,168	4.43
Nov.	6,925,043	100.9	411,161	95.9	461,354	104.2	7,797,558	100.8	1,817,613	4.29
Dec.	6,927,689	98.0	393,717	89.1	459,373	100.7	7,780,779	97.7	1,760,357	4.42
4th qtr.	20,973,485	99.8	1,214,535	92.5	1,387,212	102.3	23,575,232	99.5	1,794,158	13.14
2nd 6 mos.	40,550,038	96.5	2,298,180	87.5	2,674,209	98.6	45,522,427	96.1	1,732,867	26.27
Total	79,340,157	94.9	4,243,172	81.2	5,057,141	93.7	88,640,470	94.1	1,695,495	52.28
1949										
Jan.	7,287,683	101.1	408,552	92.6	487,260	93.8	8,183,495	100.2	1,847,290	4.43
Feb.	6,633,779	102.0	379,698	95.3	467,247	99.6	7,480,724	101.4	1,870,181	4.00
Mar.	7,473,901	103.7	430,176	97.5	483,850	93.2	8,387,927	102.7	1,893,437	4.43
1st qtr.	21,395,363	102.3	1,218,426	95.2	1,438,357	95.4	24,052,146	101.5	1,870,307	12.86
Apr.	7,015,611	100.5	404,095	94.6	365,570	72.7	7,785,276	98.4	1,814,750	4.29
*May	6,889,230	95.6	400,741	90.9	299,751	57.7	7,589,722	92.9	1,713,256	4.43
†June	5,945,317	85.2	349,196	81.8	206,819	41.1	6,501,332	82.2	1,515,462	4.29
†2nd qtr.	19,850,158	93.8	1,154,032	89.1	872,140	57.2	21,876,330	91.2	1,681,501	13.01
†1st 6 mos.	41,245,521	98.0	2,372,458	92.1	2,310,497	76.2	45,928,476	96.3	1,775,357	25.87

* Revised. † Preliminary figures subject to revision.

For 1949, percentages of capacity operated are calculated on weekly capacities of 1,626,717 net tons open hearth, 99,559 net tons bessemer and 117,240 net tons electric ingots and steel for castings, total 1,843,516 net tons; based on annual capacities as of Jan. 1, 1949, as follows: Open hearth 84,817,040 net tons, bessemer 5,191,000 net tons, electric 6,112,890 net tons, total 96,120,930.

Steel Product Shipments For May And Year To Date

Steel Products	Number of companies	Item	MAY - 1949			To Date This Year		
			Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)
Ingots, blooms, slabs, billets, tube rounds, sheet and tin bars, etc.	47	1	202,321	3.9	180,082	* 1,347,376	4.7	*1,229,710
Skelp	5	2	7,590	0.1	46,271	38,758	0.1	208,090
Wire rods	20	3	43,287	0.8	20,113	259,948	0.9	119,305
Structural shapes (heavy)	11	4	377,743	7.2	1,890	1,863,626	6.6	13,363
Steel piling	3	5	30,369	0.6	333	143,932	0.5	4,325
Plates	28	6	589,596	11.3	17,111	* 3,107,637	10.9	112,890
Rails—Standard (over 60 lbs.)	4	7	180,392	3.4	1,043	887,220	3.1	4,674
Rails—All other	5	8	12,325	0.2	164	71,648	0.3	1,178
Joint bars	7	9	10,416	0.2	4,531	57,213	0.2	18,646
Tie plates	6	10	41,085	0.8	-	208,350	0.7	41
Track spikes	8	11	10,370	0.2	-	55,073	0.2	35
Wheels (rolled or forged)	5	12	28,383	0.5	81	149,347	0.5	497
Axles	5	13	17,543	0.3	3	99,014	0.4	17
Hot rolled bars (including light shapes)	39	14	596,829	11.4	73,961	* 3,391,916	11.9	358,161
Hot rolled bars—Reinforcing	24	15	133,567	2.6	466	692,809	2.4	2,241
Cold finished bars	33	16	107,745	2.1	231	* 675,679	2.4	3,874
Tool steel bars	17	17	4,308	0.1	23	* 29,418	0.1	414
Pipe—Standard	16	18	198,578	3.8	4,480	987,613	3.5	24,707
Pipe—Line	12	19	186,934	3.6	1,534	987,592	3.5	9,905
Pipe—Oil country goods	14	20	143,469	2.7	7,354	667,650	2.4	40,218
Tubes—Boiler	3	21	10,642	0.2	520	54,375	0.2	4,748
Tubes—Mechanical and pressure	21	22	57,643	1.1	1,265	349,217	1.2	9,274
Miscellaneous pipe (including conduit)	12	23	21,232	0.4	109	122,686	0.4	595
Wire—Drawn	37	24	153,017	2.9	10,158	1,020,260	3.6	65,696
Wire—Nails and staples	17	25	72,670	1.4	388	377,690	1.3	5,021
Wire—Barbed and twisted	15	26	22,602	0.4	2	115,894	0.4	32
Wire—Woven wire fence	13	27	42,770	0.8	368	194,256	0.7	1,480
Wire—Bale ties	11	28	3,807	0.1	-	22,638	0.1	-
Black plate	10	29	30,054	0.6	86	268,530	1.0	254
Tin and terne plate—Hot dipped	10	30	131,060	2.5	-	720,078	2.5	10
Tin plate—Electrolytic	10	31	161,154	3.1	-	798,623	2.8	42
Sheets—Hot rolled	28	32	555,997	10.6	55,680	3,103,579	10.9	314,405
Sheets—Cold rolled	16	33	568,625	10.9	2,432	2,979,826	10.5	10,604
Sheets—Galvanized	15	34	150,297	2.9	110	719,084	2.5	391
Sheets—Long terne	8	35	13,786	0.3	-	66,499	0.2	353
Sheets—Enameling	7	36	14,554	0.3	513	93,187	0.3	1,253
Sheets—Electrical	11	37	26,506	0.5	-	193,000	0.7	-
Strip—Hot rolled	22	38	141,784	2.7	23,416	766,676	2.7	134,822
Strip—Cold rolled	34	39	132,429	2.5	1,770	* 762,453	2.7	10,256
All other	4	40	1,287	-	-	6,039	-	-
Total steel products	138	41	5,234,862	100.0	456,488	*28,456,409	100.0	*2,708,887

Adjusted.

Pricing Bill Changes

Added by House amendments to O'Mahoney measure still to be accepted by Senate

ALTHOUGH an amended version of the O'Mahoney freight absorption bill passed the House on July 7, it was uncertain last week just how long it will take for the bill to be finally enacted into law. It still must go to conference for ironing out the differences in the measure as passed by the House and Senate.

As passed by the House, the measure includes provisions added by Rep. John A. Carroll (Dem., Colo.) which are aimed at insuring that amendments to the Robinson-Patman Act in the O'Mahoney bill do not lessen competition or tend to create monopolies in commerce.

The Carroll amendments affect both Section 2 (a) and Section 2 (b) of the Robinson-Patman Act.

Pays Off—That it pays to "write your congressman" was demonstrated during the debate that culminated in House voice vote approval of the bill. Legislators quoted or referred to many communications they had received from different industries asking them to vote favorably on the bill. The great majority came from that segment of the economy most congressmen are eager to aid—namely, small business.

Inasmuch as the Carroll amendments were motivated by the same purpose as those proposed by Senator Kefauver and adopted by the Senate, it is likely one set or the other will be approved by the conferees and be part of the act that eventually will be passed.

Kefauver Amendments—The first Kefauver amendment qualified the right to absorb freight to meet the equally low price of a competitor in good faith with the words "except where the effect of such absorption of freight will be to substantially lessen competition." The first Carroll amendment to replace this Kefauver amendment reads: "Except where such absorption of freight would be such that its effect upon competition may be that prohibited by this section."

The second Kefauver amendment provided that a seller may justify a discrimination "other than a discrimination which will substantially lessen competition," etc. The second Carroll amendment replaces the quoted words with this language: "if the discrimination is not such that its effect upon competition may be that prohibited by this section."

A U. S. attorney says it may take another 25 years to obtain court clarification of the effect of such amendments.

Conduit Pleas Are Denied

APPLICATION of rigid steel conduit producers for modification of the cease and desist order against use of basing point prices has been denied by the Federal Trade Commission. At the same time the commission declined to join with the industry in an application for a stay of enforcement of the Supreme Court mandate enforcing the ruling which went into effect July 9.

FTC's order may be appealable, in which event a stay could be based on the pendency of an appeal, it is pointed out in the trade.

The order, directed against a basing point system of delivered prices, was entered by the commission June 6, 1944, and subsequently was affirmed by the Seventh Circuit United States Circuit Court of Appeals and the Supreme Court.

All the commissioners joined in the decision to deny the motion. Acting Chairman Lowell B. Mason filed a concurring opinion.

In denying the motion the commission said: "The purpose of the requested modification is said to be to make clear that the order does not prohibit any of the respondents, acting independently, from quoting or selling at delivered prices or from absorbing freight. The commission does not consider that the order in its present form prohibits the independent practice of freight absorption or selling at delivered prices by individual sellers. What the questioned portion of the order does prohibit is the continuance of the basing-point, delivered-price system, found to have been the subject of conspiracy, or any variation thereof which might be accomplished through the practices specified . . ., when done, as stated in the order, 'for the purpose or with the effect of systematically matching delivered price quotations.' "

Concurring opinion of acting chairman Lowell B. Mason: "My concurrence in the above order is based solely on the grounds that the respondents' motion does not fulfill the requirements of the statute. They have set forth no change of fact.

"As to the law, while there are some semantic hedgings put about the commission's power to prohibit a citizen from disposing of his wares in distant markets by systematically paying the freight on his products, the whole thing can be boiled down to the plain fact that we can do just that under the present decisions of the commission, and we can do it without the necessity of finding anyone has done a conspiratorial act. This new socioeconomic basis for a cease and desist order is now the subject of legislative scrutiny.

"Should legislation be enacted and change the above power of the commission, it might then be proper for the respondents to move for the reopening. However, the commission is here asked to modify its order on the assumption that legislation will be enacted. Governmental agencies cannot operate on such a basis."

"HI-LO TRAILER": This hydraulic wheel suspension on a truck trailer permits trailer body to be raised or lowered to facilitate loading and unloading. Similar to the retractable landing gear of a plane, the mechanism is powered by a gasoline engine. Inventor of the device is A. M. Meldrum, San Francisco. NEA photo

Charge Price Discrimination

FEDERAL Trade Commission has issued complaints charging two cement manufacturers with unlawfully discriminating in price against customers who take delivery by truck or other motor transport. Violation of the Clayton Act, as amended by

the Robinson-Patman Act, is alleged.

Complaints were served on: Ideal Cement Co. (Colorado Portland Division), Denver, and its officers; Monolith Portland Cement Co., and its subsidiary, Monolith Portland Midwest Co., Los Angeles, and officers.

Complaints charge the respondents discriminate in price between competing purchasers by selling cement to some customers at higher prices than are charged others. The discriminations arise, it is alleged, from the respondents' pricing policy whereby purchasers who have the cement transported by rail freight obtain it at a price 20 cents per barrel lower than customers who have it transported by truck or other forms of motor transportation.

The alleged unlawful price policies are said to have been in effect since Jan. 1, 1947.

Summer Slowdown

In machine tool orders accentuated by plant closings. Automotive retooling orders lag

USUAL summer slowdown in new orders for machine tools is accentuated this year by the fact that many potential customers are closing their plants for mass vacations and in a number of instances keeping them closed for additional periods. In view of this, one large eastern machine tool builder is closing his plant and sales offices around the country for a similar two-week period.

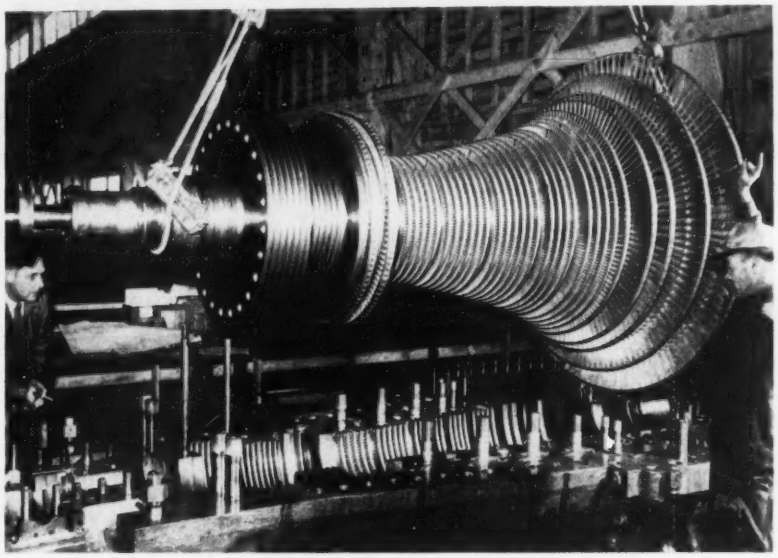
Contemplated changeovers by several automobile builders have not materialized in any large orders for machine tools to date.

Buying Spotty—Government buying is spotty and not in very large volume at present. Aircraft manufacturers hesitate to do any extensive buying because of the uncertainties attending the aircraft program.

The market for used and rebuilt machine tools is no better than for new equipment. Firms engaged in rebuilding and reconditioning machine tools report they have a lot of would-be sellers but few buyers.

Figures Differ—Since the release of the Census of Manufactures figures on 1947 machine tool shipments there has been some question as to the large difference between the $502 million figure for the year as reported by the government agency and the $306 million reported for the same period by the National Machine Tool Builders' Association. Included in the government figures are home workshop tools, parts and rebuilt machine tools which are not included in the association figures covering shipments of new machine tools. Subtracting these items from the Bureau of Census total brings the dollar value down to $322 million.

In addition the government figures include interplant transfers, that is, machines built by a company which is not a machine tool builder for use in another plant belonging to the same company. Such machines are largely of the special-purpose type. The total dollar value of such machines is not available but any deduction would tend to bring the two sets of shipments figures further into line.



BOOST FOR WEST COAST POWER: A 12,500-kva steam turbine spindle is shown being eased into position in the lower half of its housing at the Sunnyvale, Calif., plant of Westinghouse Electric Corp. The spindle with its more than 4000 blades will turn 3600 rpm. Blades are stainless steel, carefully machined to exact shapes to take maximum advantage of the steam pressure and flow inside the housing. Turbine is destined for Tucson Gas, Electric Light & Power Co.

Rod, Reel Output Near Peak

NATION'S fishermen can pull in the big ones with 8 million new metal rods and reels which will have been made by yearend. This production will be near the 1948 and 1947 peaks.

Shakespeare Co., Kalamazoo, Mich., a leading producer, reports its demand holding, shipments stable and purchasing as high as ever. Its steel supplies are the equivalent of 90 days' production. Inventories in dealers' hands are larger than a year ago. Export sales are weak, but imported equipment offers little competition.

Unit production of metal fishing rods and reels has doubled since 1939, and dollar value has jumped five-fold. Approximately 150 firms—twice the number operating in 1941—turn out most of the 8 million rods and reels. In 1939 nearly 4 million were made. During 1947, latest year for which figures are available, output was worth $27,362,000, compared with $5,232,000 in 1939.

Study New England Steel

STEP toward development of a New England steel industry was taken last week by the Iron & Steel Supply Committee of the New England Council when it retained John E. Kelly, consulting engineer, to study the area's position as a steel producer and consumer.

Interest in New England's part in America's steel production has followed recent Canadian mining developments and the rapid growth of the area's metalworking industry which today employs 36.5 per cent of the region's labor force, according to Frederick S. Blackall Jr., committee chairman, and past president of the New England Council. He also is president and treasurer of the Taft-Peirce Mfg. Co.

Labrador-Quebec ores, Mr. Blackall said, will become available in 1952 and the council committee understands this ore can be laid down on the New England coast at approximately the same price that Mesabi ore can be laid down in Duluth.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Monopoly study launched by House Judiciary subcommittee. Hearings will continue into 1950. No recommendations will be made to Congress until the next session

COMPREHENSIVE, long-term study of the nation's antitrust laws got under way last week before a House Judiciary subcommittee, headed by Rep. Emanuel Celler (Dem., N. Y.).

The investigation, which has the full blessing of President Truman, will continue for the next two weeks and then be recessed until later in the year. Hearings are expected to continue into next year and no recommendations will be made to Congress until the next session.

First witness before the subcommittee was Attorney General Tom Clark. Mr. Clark held that present antitrust laws have succeeded in maintaining competition in the national economy and indicated that he believed no widespread overhauling of the legislation was necessary.

Defers Recommendations—The attorney general did not make any suggestions for tightening the antitrust laws or for removing any of the exemptions from the Sherman Act and the Clayton Act, a prime target of the subcommittee. He said the Justice Department would present its recommendations later.

Despite his belief in the success of the antitrust laws, Mr. Clark told the committee that the trend toward economic concentration is increasing, and that the trend was accentuated by the war.

Exemptions Are Target—Representative Celler said the committee would devote much attention to the exemptions permitted under the present laws. Specifically he mentioned the Reed-Bullwinkle bill which permits railroads to get together to fix rates with Interstate Commerce Commission approval, the Miller-Tydings Act which permits state laws allowing manufacturers to fix retail prices on certain articles, and the Webb-Pomerene Act which allows companies to band together in export associations.

Representative Celler said he does not propose to repeat the work done by the Temporary National Economic Committee 10 years ago, but will try to bring that work up to date and to study the changes brought by the war and the expansion of business and industry that accompanied the war.

TNEC Chairman Testifies—One of the first witnesses before the Celler committee was Sen. Joseph C. O'Mahoney (Dem., Wyo.), chairman of the TNEC.

Other witnesses scheduled will be called from the Securities & Exchange Commission, Federal Trade Commission, Federal Reserve Board and Justice Department.

Engineer-Economist David Cushman Coyle has been appointed to supervise the study.

NSRB Being Revitalized

IS THE long-somnolent National Security Resources Board about to get a real shot in the arm? Some informed sources in Washington answer this question affirmatively. The White House order of June 25 for a co-ordinated program of civil defense planning by nine federal departments and agencies, working under William A. Gill of the NSRB, is said to be only the first of a number of revitalizing orders. Soon, they say, will come a directive for industrial and civilian mobilization planning, which, on the basis of the National Security Act of 1947, is supposed to be NSRB's chief concern.

Woefully neglected ever since the resignation of Chairman Arthur M. Hill in December of 1948, the whole subject of industrial mobilization planning involves many unanswered questions affecting key industries. In regard to steel, one of the important uncompleted studies is that as to future reserves of iron ore; one of the questions is: Should a portion of the unmined lake ore be set aside as a national stockpile for emergency use? Another: Should over-age slot-type coke ovens be replaced with new ones without delay in the interest of national security? In regard to machine tools, the last activity was the so-called "phantom order" program in which machine tool builders were to get orders beforehand, for release in a time of emergency on receipt of a telegram from Washington; this activity, generally considered as a good one from the standpoint of industrial mobilization planning, needs to be revived.

REP. EMANUEL CELLER

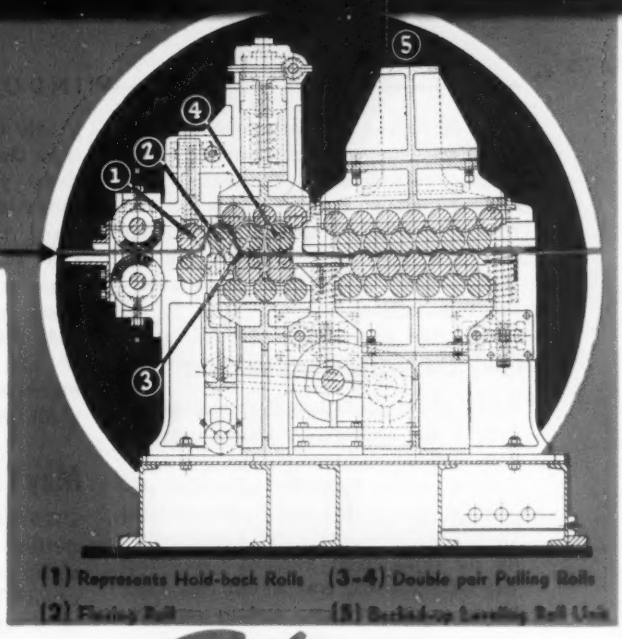
Bypass Small Business Group

WHEN the Holland-Wherry resolution to establish a standing committee on small business came up in the Senate on July 6 it was passed over after an explanation by Majority Leader Scott W. Lucas (Dem., Ill.) who said lengthy debate would be required to reconcile conflicting views as to whether the contemplated small business group should be a special or standing committee. He said a place for the debate might be arranged on the Senate schedule prior to adjournment. Opposition to the proposal of a standing committee stems from the fact that the matters with which this committee would be concerned—matters of taxation, finance, interstate and foreign commerce, growth of concentration of industry, antitrust legislation, government and armed services procurement, and many others—already are within the province of regular standing committees, but there is general agreement that there should be a small business committee, whether it is special or standing.

Steel Study Revived

SIDETRACKED by other activities, notably the effort to kill the O'Mahoney bill to legalize freight absorption, the steel distribution study of the House Small Business Committee is to be revived as soon as possible and conducted from a long-range point of view. Purpose of the study, initiated by the committee chairman, Rep. Wright Patman (Dem., Tex.), is to show that steel consumers in Texas and some other states have to pay

BUDD-McKAY



(1) Represents Hold-back Rolls (3-4) Double pair Pulling Rolls
(2) Flexing Roll (5) Backed-up Leveling Roll Unit

IN operation, a sheet is fed between the brush rolls, the hold-back rolls and into the bite of the pulling rolls which draw it into the machine. After the sheet is securely gripped by the pulling rolls, the flexing roll is automatically shifted from its idle position below the pass line into its upper, or working, position as indicated by (2). This causes the sheet to go into a full quarter turn around the exit side of the hold-back rolls (1), a reverse half-turn upward over the flexing roll (2), and another reverse quarter turn downward around the first top pulling roll (3).

The triple bending, or flexing, of the sheet as it passes in and out of the loop kneads the steel and imparts the desired amount of cold plasticity. A second set of pulling rolls (4) directs the sheet into the backed-up leveling rolls where it is flexed repeatedly and finally ejected a flat sheet.

The progressive advancement of the bend throughout the area of the sheet, followed by a pass through the staggered leveler rolls, permits the flexing to be carried much further beyond the elastic limit of the steel than is possible by any roller leveler, thus affording greater freedom from stretcher strains.

While conventional four-high roller leveling machines assist fabricators in securing a suitable texture in steel sheets, yet the mechanical work accomplished is not sufficient to make the sheet altogether immune from surface blemishes. The flexing action of the BUDD-McKAY PROCESSOR frees the grain structure so that, when the steel is drawn under dies to the desired contour, stretcher strains do not occur.

Sheets processed by the BUDD-McKAY PROCESSOR remain free from strains longer because of the extreme flexing and thorough roller leveling, but subsequent forming operations should follow soon after the processing if its full benefits are to be obtained, as a lapse of time causes the sheet to display a tendency to return to its initial condition.

Sheet PROCESSING MACHINE

WITH THE NEW BUDD-McKAY SHEET PROCESSING MACHINE it is possible to render sheets free of stretcher strains. Sheets processed on this patented processing machine have far superior stamping and drawing qualities, and retain these qualities much longer, than sheets processed by any other method.

BUDD-McKAY
(PATENTED)
PROCESSOR

The **McKAY MACHINE** *Company*
ENGINEERS AND MANUFACTURERS OF SHEET, TIN, AND STRIP MILL EQUIPMENT
YOUNGSTOWN, OHIO
ASSOCIATED COMPANY
The WEAN ENGINEERING CO., Inc. • WARREN, OHIO

high delivered prices as compared with consumers located in or close to steel mill centers. The study will seek to show that sections of the country which recently have shown a trend toward industrialization should have their own local steel-making sources.

ODT Undergoes Liquidation

OFFICE of Defense Transportation, last of the emergency wartime agencies, formally passed out of existence July 6 when President Truman issued an executive order designating the Interstate Commerce Commission as its liquidation agency. Actually the ODT's work was at an end June 30 when its various orders expired. Last important activity of the ODT was in connection with the allocation of steel for the construction of 10,000 freight cars monthly, a program which it later handled jointly with Commerce's Office of Industry Cooperation.

To Transmit Power Via Cable

BUREAU OF RECLAMATION, Department of the Interior, has decided to transmit power for operation of Granby pumping plant on the Colorado-Big Thompson projects via cable through the Alva B. Adams irrigation tunnel under the Continental Divide. Low bid of $986,000 for transmitting power in this unprecedented manner would be a saving of about $500,000 under the bid for a tower line through the almost inaccessible area swept by bitterly cold storms bringing severe icing conditions. Commissioner of Reclamation awarded the contract to Electrical Constructors Inc. and C. M. Elliott, Chula Vista, Calif.

British Industries Picks Edwards

W. P. N. Edwards, newly appointed deputy overseas director of the Federation of British Industries, long has been active on the American scene. A Princeton University graduate in the class of 1926, he served with the British Supply Mission in Washington during the war and for the past three years has headed all British information in the United States with headquarters in the British Embassy in Washington. Mr. Edwards will assume his new duties in September with offices in London, and is expected to make frequent visits to the United States on United States-British business activities.

Rural Electrification Doubles

ELECTRICITY used by rural people, served through the Rural Electrification Administration program, has nearly doubled in the last two years, says the Agriculture Department. On fiscal year basis, 42 per cent more miles of line construction were energized this year than in the peak year of 1948 and about 35 per cent more power was distributed than in 1948. Setting another record in the 1949 fiscal year, REA approved loans of almost $450 million, nearly as much as was approved in the first eight years of the REA program.

May Continue Scrap on Free List

BILL to extend suspension of import duties on ferrous and nonferrous scrap until June 30, 1950, has been reported to the House by the Ways & Means Committee. The committee adopted an amendment eliminating aluminum scrap.

Promote Alcohol as Fuel

PROMOTION of the use of ethyl alcohol as a motor fuel, or as an anti-knock ingredient in gasoline, is actively on the agenda of the Senate Agriculture Committee's Subcommittee on Utilization of Farm Crops. Sen. Guy M. Gillette (Dem., Iowa) is chairman of the subcommittee, which is exploring the possibilities for consuming more grain. One of the witnesses was C. H. Van Hartesveldt, vice president, Thompson Vita-Meter Corp., who reported:

"Our work to date has resulted in 9 million vehicle miles of operation with vitameter-alcohol injection. For example, one-half of all the taxicabs in Cleveland are running on 63 octane fuel and a methanol anti-detonant fluid supplied commercially by the Ashland Oil & Refining Co. Test markets have also been opened in Columbus and Cincinnati, where the vitameter and alcohol fluid have been made available to the public for the addition of octane numbers to commercial gasoline. Results to date are gratifying."

Coke Output at All-Time High

COKE industry in 1948 produced 74,861,928 net tons, 2 per cent more than in 1947 and 1 per cent more than the wartime peak in 1944, Bureau of Mines reports. Although output of beehive coke declined 109,730 tons, production at oven-coke plants was 1,525,808 tons more than in 1947.

The quantity of coal carbonized in ovens was also the greatest on record, but the quality was down because a large proportion of inferior coal was purchased in the first part of 1948 in anticipation of interruption in coal production. As a result, the yield of coke per ton of coal dropped from 69.91 per cent in 1947 to 69.60. The yield improved in the last part of 1948 and should become still better in 1949.

Metallurgical coke output in 1948 totaled 63,036,165 tons, or 85 per cent of all coke sold and used by producers; 7,733,382 tons, or 10 per cent went for other industrial uses; and 3,445,309 tons, or 5 per cent, was used for domestic heating. Coke for household consumption had dropped markedly since 1940 when 14 per cent of all coke sold was so used. Despite the increased use of coke in 1948, producers' stocks at the end of the year amounted to 1,593,441 tons, a 54 per cent increase.

Mining Claims Must Be Filed

MINING claims holders on federal public lands must file by noon of Aug. 1 a statement of intention to hold claims, Interior Secretary J. A. Krug announces. Prospectors may lose ownership rights if they do not file statements in offices where location notices are recorded. Failure to do so throws the claim open to relocation by others. A recently passed law, necessitating $100 improvement each year, makes filing necessary.

Tungsten Investigation Reported

INVESTIGATION of possible sources of tungsten to expand national reserves of this strategic mineral is described in a Bureau of Mines report. Darwin district, Inyo county, California, where the ore has been reported since 1915, has not reported any production since the end of the war. Exploration of the area revealed no new reserves.

Diesel Locomotive Gain Shown

RAILROAD reports to the Interstate Commerce Commission show the big change which has taken place in motive power from steam to diesel-electric over a 5-year period.

At the end of the first quarter this year there were 6594 diesel-electric locomotives in service on Class 1 railroads, including terminal and switching companies. This was 4444 more than were in service on the like date of 1944.

Of the 39,299 locomotives of all kinds in service in March this year, the diesels represented 16.8 per cent compared with 5 per cent of the 42,890 in service in 1944.

On Mar. 31 this year there were 7963 fewer steam locomotives in service on Class 1 railroads than five years ago.

British Relapse—Others Feel Pulses

French president says country is reviving. Ruhr steelmen see no cause for gloom. Belgium points to its stable currency. Italian oil discovery spurs optimism

ECONOMIC relapse in Britain has brought a flurry of temperature readings for the other patients in the Marshall Plan recovery ward. A fall in U.K. exports to the United States, fear of sterling devaluation and falling prices of raw materials—especialy rubber, cocoa and wool—sold for dollars by sterling countries have all contributed to British difficulties.

Vincent Auriol, president of France, says "the franc is consolidating from day to day . . . and our country is decidedly recovering its health and its life."

Consensus among Ruhr industrialists is: "There is no reason to be gloomy about Western Germany's economic situation. Expanding credit and improved investment machinery will counteract the slight recession."

Belgian and Luxemburg economists point out that the Benelux Union is the only creditor nation among ERP countries.

Italians are worried about the business recession, but these alarms are dispelled by discovery of oil—the first in Italy—in the Po valley. Government spokesmen have described this strike as the most significant economic development for Italy since the inauguration of the Marshall Plan.

France

FRENCH cost of living continues to decline, but retail prices are still 17.7 times the 1938 level. Industrial prices fell 1.6 per cent from April to May and are now 20.8 times the 1938 level.

French used cars still cost 3 to 5 per cent more than new ones. An estimated $100 million in modern equipment is needed by the nation's auto industry to bring the 1951 output to 511,000 units and to export 78,000 vehicles. The machine tool makers are busy, both on domestic and foreign orders. Nearly $300,000 in machine tools has been contracted for or shipped to Indonesia during the past 12 months. Foundries specializing in large castings for diesel engines, metallurgical equipment and mining machinery are active, but small castings makers buck a buyers' market.

Iron and steel exports, while still above the 1948 level, are below the postwar record shipments of 441,000 tons made during the first four months of this year. Exports consist largely of merchant bars and pig iron.

Some of the nationalized airplane factories have been closed down. The whole industry—operating at a loss since the war—will be reorganized.

About $108 million has been released from France's counterpart fund for investment and reconstruction programs for July. The sum will be used to develop electric power, reconstruct and modernize railroads and coal mines, aid private industry and agriculture and develop overseas territories.

Western Germany

FIRST trickle of credits, arranged by the new German Bank for Industrial Reconstruction, will be directed into the steel industry this month to finance repairs to 15 plants. Although a rather small allotment was made to steel, only $12 million, this sum is seen as a forerunner to more liberal capital investment policies.

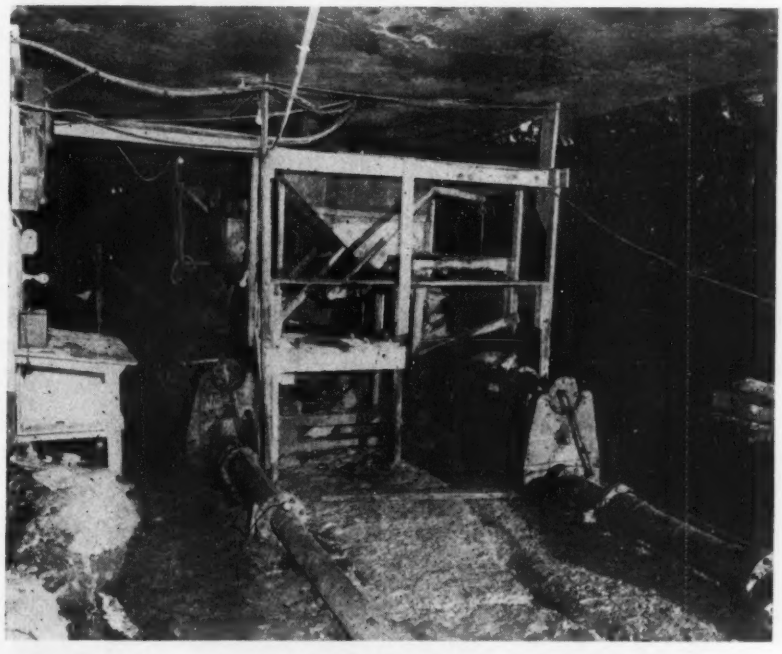
New plan for dismantlings is also a basis for optimism. French and British sources are reported in favor of a scheme to give plants scheduled for tearing down to the reparations owner, but to leave them standing in Germany.

Reorganization of the steel industry of the Ruhr is at a standstill although the 12 custodians have been named. Little is expected to happen until after the new government of Western Germany is elected in mid-August. Steel production is maintained at the annual rate of 9.9 million net tons. Exports are climbing; they reached $462 million during the first five months, against $142 million for the same period last year.

Prices of German automobiles are declining. Domestic quotation for the Volkswagen, at $1566, is now 10 per cent lower than a month ago. Six German companies are producing 13 passenger car models. The smallest is the Wendax roadster, with a two-cylinder engine. Besides the Volkswagen, other popular makes are the Ford and the Opel, a GM product. Although auto prices are still too high for the export market, trucks are selling well abroad.

Belgium, Luxemburg

EXPORTS of iron and steel from Belgium and Luxemburg in May to-



UNDERGROUND COAL CRUSHER: Concrete for 340-foot underground coal preparation chamber at Jones & Laughlin Steel Corp.'s combined Vesta mines No. 4 and 5 is being poured by Dravo Corp. workmen with pneumatic equipment. Ready-mixed concrete is dropped through a 10-inch hole from the surface into hoppers of pneumatic placers and then is piped by compressed air to pouring location. Compressed air is supplied from a temporary compressor on the surface

taled 343,000 tons, compared with 336,148 tons in April. The largest buyer during the month was the U. K. with 71,500 tons, followed by the Netherlands and Sweden. Shipments to the United States fell to 2875 tons, against 8353 in April, 37,174 in March and 50,635 in February.

Exports of fabricated steel and machinery are improving slightly. Only 41 blast furnaces are now in operation, against 44 in January. The scrap market is dull.

Italy

LARGE oil deposits and enough methane gas to last Italy's industry 75 years have been discovered in the Po river valley near Lodi, Piacenza and Cremona. Even larger reserves of the fuels than already have been explored may exist.

Owned by the state, the area was being investigated by engineers examining the methane gas deposits which were already known. Far more gas was discovered than suspected and an estimated 100,000 tons of oil may be drilled annually in the district. About 300 million cubic meters of gas will be taken for the remainder of 1949. By 1955, 9 billion cubic meters will be used, about equivalent in energy to the quantity of coal now imported annually.

The extraction of the oil represents more of a problem. No Italian firms make oil well equipment which will have to be imported from the U. S. and Britain. American and English oil companies also have substantial financial interest in the Italian refining firms.

Five projects to modernize Italy's iron and steel industry have been approved by ECA. Most of the equipment will be purchased in the U. S. The projects are:

Equipment for modernization of steel works of Acciaierie e Ferriere Lombarde Falck at Milan—$2.2 million in ECA funds and 1.7 billion lire. Equipment needed includes electric furnaces, tube forming and welding mill, forging and forming machines for nuts and bolts, and strip welder for cold strip mill.

Cold-rolling tin plate mill for Cantieri Metallurgical Italiani at Catellammare di Stabia—$1,962,235 in ECA funds and 287.5 million lire. Equipment to be purchased includes reversing stand for cold-rolling strip, straightening machine, pickling train, welding machine, strip washing plant, galvanizing machine and corrugating press.

Slab and billet mill for special steel for Cogne S.p.A. in the Aosta valley—$1,034,000 in ECA funds and 273 million lire. Equipment immediately required includes a ten-ton oxygen plant, single stand pig casting machine and slab and billet rolling mill.

Continuous wire rod mill and bolt and nut equipment for SISMA at Villadessola—$2,450,000 in ECA funds and 1.6 billion lire. Equipment to be purchased includes rolling mill unit for billets complete with accessories and bolt maker for nuts and bolts.

Slab and billet mill for I.L.S.S.A.—Viola at Pont St. Martin, Aosta valley—$1,465,000 in ECA funds and 800 million lire. Project involves purchase of a three-stand rolling mill to enable the plant to produce billets and slabs

RECORD BREAKER: A drilling crew member "tongs up" a section of drill pipe as the string is hauled to the surface at Pacific Creek No. 1 oil well near Rock Springs, Wyo., where a new world record for depth was set. Helping Superior Oil Co. reach the record depth of 30,521 feet was equipment furnished by National Supply Co., Pittsburgh

Team to Study U. S. Building

ECA in co-operation with Anglo-American Council on Productivity is sponsoring a 17-man team of British architects, contractors, surveyors and workers to study American construction methods. Representing Great Britain's building industry, the team is particularly interested in methods of utilizing materials other than lumber for home building. The group will also study methods of design, cost and procedures and labor relations in the building of small schools, industrial plants and commercial buildings.

Suppliers Object, ECA Changes

ECA has changed procedures for submission of information by suppliers of Marshall Plan goods. The change came after suppliers objected to having such details of their transactions as commissions paid made known generally. Suppliers now turn in duplicate copies of certificates with invoice and contract abstract filled out except for agents' commissions, contract and price and class of agent. However, these copies must have a

certification by the supplier that a completely filled-out third copy was sent to the ECA controller in Washington.

Coast Costs Down

Prices on many materials have been cut. Subcontractors willing to pare profits for work

BUILDING costs, both for residential and commercial work, are coming down on the West Coast.

Several factors are influencing the downtrend.

Although wages have not been reduced, worker efficiency has risen.

Prices of many materials have been cut, and premiums, which contractors have had to pay for some materials, have disappeared. The quality of materials has improved.

Subcontracting costs also have been reduced all along the line. The reason is greater competition for the smaller number of jobs. Subcontractors now are willing to pare profits in order to get work. The result is basic contractors, and, eventually, the consumers are able to get jobs completed at less cost.

Costs Reduced—The overall reduction in costs varies. Some builders estimate reductions total up to 10 per cent since the first of the year. Others say cost cuts have been smaller. But, without question, a definite downtrend is under way.

One major factor in residential cost cuts is the price drop of about 30 per cent in lumber.

In commercial building, reductions are more widespread. Much of the cuts are due to lower prices for metal products.

For example, one West Coast builder estimates structural reinforcing costs have been reduced 30 to 40 per cent because he no longer has to pay premiums for steel.

Nonferrous Metals Lower—Declining prices of nonferrous metals, especially copper, have cut the cost of electrical work. One contractor estimates costs are down an average of 15 per cent. Wire is down 30 per cent, he says, pipe is off 20 per cent, and outlet boxes are about 15 per cent less. Labor efficiency, he reports, has improved about 10 per cent.

Similar cuts are reported by plumbing contractors. One builder says fixtures have been reduced about 10 to 15 per cent in the last four months; cast iron pipe is down 20 per cent; and caulking lead has followed the price of lead downward.

All builders have benefited from the disappearance of premiums on nails and other wire products. In some cases this has meant a 50 per cent reduction on these items.

Although building of both houses and commercial buildings continues to lag on the West Coast, contractors believe the current cost downtrend, if extended, will bring more buyers into the market for new homes and factories.

Lustron Ships 24 Homes in Day

JULY production of Lustron homes should be 50 per cent above June when output was 50 per cent above May, states Joe Tucker, senior vice president, Lustron Corp., Columbus, O.

Working one major shift plus a small "make up" shift, the company has shipped a peak of 24 homes in one day. Lustron employment is 3414 persons; monthly payroll averages $880,000.

Building New Fighter Plane

AIR FORCE's newest version of the Republic F-84 Thunderjet fighter, to be designated F-84E, is in production at Republic's Farmingdale, Long Island, N. Y., plant. Power for the fighter is supplied by an Allison J-35-17 turbojet engine rated at 5000 pounds thrust. Combat radius will be more than 850 miles as compared with the 600-mile radius of present models. Service ceiling has been increased more than 5000 feet to over 45,000 feet.

Points Out Nuclear Energy Limits

NUCLEAR energy probably never can be used to run automobiles or locomotives but it can be used to propel large ships, submarines and airplanes, stated Glenn T. Seaborg, atomic scientist, addressing the semiannual meeting of the American Society of Mechanical Engineers which was held in San Francisco, June 27 to July 1.

Mr. Seaborg, member of the General Advisory Committee to the Atomic Energy Commission, said bulky shielding requirements will make early atomic energy plants best suited to stationary structures. It is quite possible, however, that such machines can be developed for mobile units where limitations on space and weight are not too great.

A number of difficult engineering problems must be solved before any of these uses come to pass, Mr. Seaborg said, and that will take time. Within a decade it should be possible to build a power plant that can produce useful energy on the scale of 100,000 kw, he estimated.

The machines will have to run at high temperatures in order to extract energy in useful form, he explained, and this means there will be problems involving materials of construction. Both the construction materials and coolants used will have to be low in neutron absorption. In addition, very efficient means must be found to purify plutonium and uranium and also to repurify these materials in order that the unburned fuel may be used again.

CALENDAR
OF MEETINGS

July 20-22, Pressed Metal Institute: Annual convention, Hotel Cleveland, Cleveland. Institute headquarters are at 13210 Shaker Sq., Cleveland.

July 22, Truck-Trailer Manufacturers Association: Midyear general meeting, Edgewater Beach Hotel, Chicago. Association headquarters are at 809 National Press Bldg., Washington.

July 28-29, American Foundrymen's Society: Annual directors' meeting, Chicago.

Aug. 10-12, Western Packaging Exposition: Civic Auditorium, San Francisco.

Sept. 9-12, Instrument Society of America: Clinic on maintenance of industrial instruments, Hotel Statler, St. Louis. Society headquarters are at 921 Ridge Ave., Pittsburgh.

Sept. 12-16, Instrument Society of America: National conference and exhibit, Municipal Auditorium, St. Louis. Society headquarters are at 921 Ridge Ave., Pittsburgh.

Sept. 15-16, Magnesium Association: Quarterly meeting, Hotel Statler, Detroit. Association headquarters are at 30 Rockefeller Plaza, New York.

Sept. 21-24, National Association of Foremen: 26th convention, Hotel Statler and Masonic Temple, Detroit. Association headquarters are at 321 W. First St., Dayton, O.

Sept. 25-Oct. 1, American Institute of Mining & Metallurgical Engineers: Midyear meeting, Neil House, Columbus, O. Details may be obtained from J. H. Melvin, Orton Hall, Ohio State University, Columbus, O.

Sept. 26-28, National Electronics Conference: 1949 conference and exhibit sponsored by Illinois Institute of Technology, Edgewater Beach Hotel, Chicago. Nathan Cohn, Room 1505, 307 N. Michigan Ave., Chicago, heads the exhibits committee.

Sept. 29, American Iron & Steel Institute: Regional technical meeting, Hotel Statler, Buffalo.

Oct. 3-4, National Association of Corrosion Engineers: South central regional meeting, Adolphus Hotel, Dallas, Tex. Heading the arrangements committee is G. R. Olson, United Gas Pipe Line Co., Shreveport, La.

Oct. 3-5, American Coke & Coal Chemicals Institute: Annual meeting, Skytop Lodge, Skytop, Pa. Institute headquarters are at 729 15th St., Washington.

Oct. 3-6, Association of Iron & Steel Engineers: Annual convention, William Penn Hotel, Pittsburgh. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

Oct. 4-6, Society of Industrial Packaging & Materials Handling Engineers: Fourth annual exposition, Detroit.

Oct. 6, American Iron & Steel Institute: Regional technical meeting, Drake Hotel, Chicago.

Oct. 10-14, American Society for Testing Materials: First Pacific area national meeting, Fairmont Hotel, San Francisco. National headquarters are at 1916 Race St., Philadelphia.

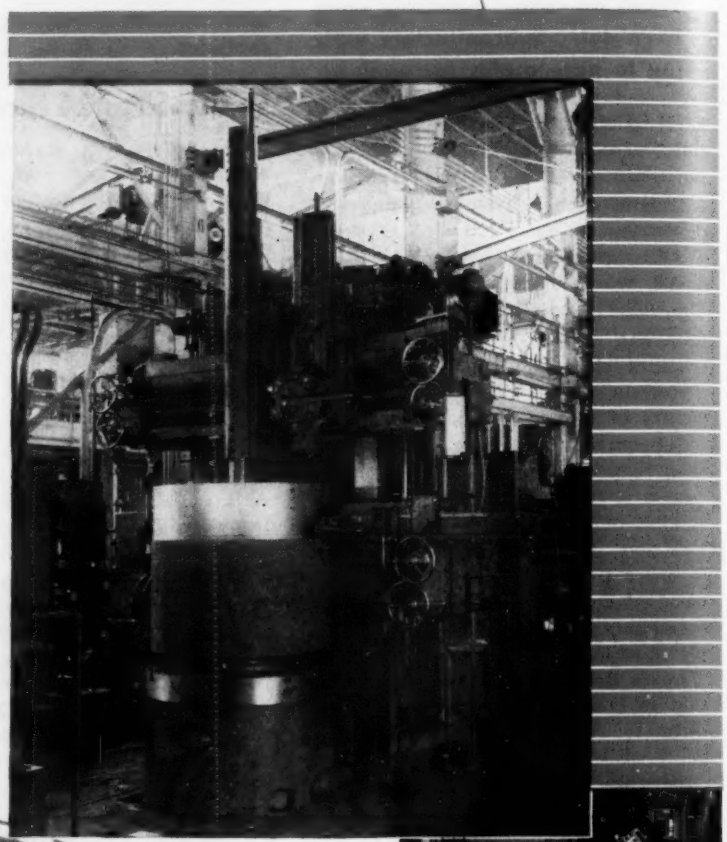
Oct. 12-15, Electrochemical Society: 96th convention, La Salle Hotel, Chicago. Details may be obtained from H. B. Linford, secretary of the society.

Rugged Work in a Foreign Land

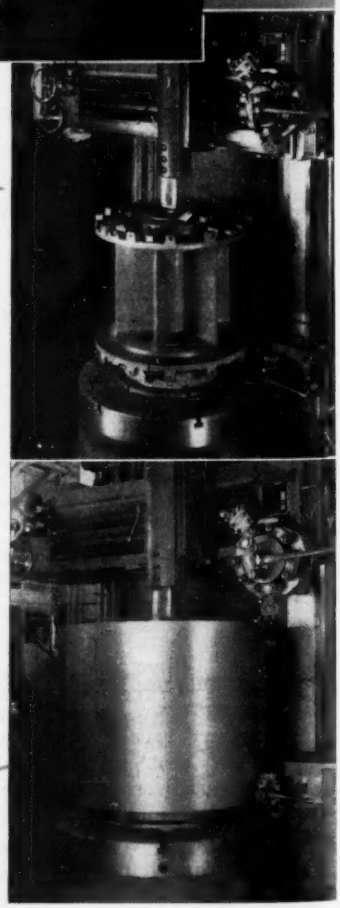
Requires an Especially

Rugged Machine

Selection of Bullard Cut Master for foreign duty bespeaks confidence in Reliability of Performance with minimum liability of breakdowns.



BULLARD



Fixture and Bull Center used to hold the work rigid.

This 54-inch high bed **Bullard Cut Master** going to India was selected for this tough job because of its especially rugged construction.

The 3 Head combination exactly met the requirements of this particular job.

Main Ram Head with anti-friction bearing Bull Center holds the internal fixture rigid against the heavy cutting required.

Side Head takes a long heavy cut with three tools on the full length of outside diameter. Then an interrupted undercut is made on the bottom surface to finish-off numerous lugs.

At the same time undercutting is in operation, the Turret Head is used to face-off the lugs on the top surface.

Write for circular illustrating Cut Master's rigid construction and describing its manufacturing refinements.

THE BULLARD COMPANY

BRIDGEPORT 2, CONNECTICUT

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Chrysler modifies styling by changing suspension systems. Height reduced 1 to 1½ inches. Demand still exceeds supply, with dealers understocked

DETROIT

FOR several months reports have been circulated through automotive circles that Chrysler was making modifications in its current line of passenger cars, introduced early this year. Discussion ran to the effect there had been some objections voiced to the styling which was described as too square, too boxy, too high, etc. One news service stated changes were in store for roof and rear quarter panels, as well as rear fenders, although company sources denied any such major revisions were in prospect. At the time the cars were introduced, K. T. Keller, Chrysler president, said the goal had been soundly engineered designs providing comfortable and roomy transportation, adding that he did not care particularly whether they were "low enough to spit over."

Latest word on Chrysler changes comes from the authoritative *Automotive News* which discloses the company's entire line has been made substantially lower in height by changes in the suspension systems, involving shorter coil springs in front and a slight flattening of the arc of rear springs. Result was a reduction in height of 1 inch in front and 1½ inches at the rear which, along with a slight lowering of the ornamental molding on the body sides, gave a still lower appearance. In addition, a lower center of gravity was achieved, lessening the tendency toward tire squeal on turns.

No official announcement has been made by Chrysler, details coming apparently from dealers who are said to have greeted the changes with wholehearted approval, principally because of the effect on overall appearance in respect to softening the body bulge at the rear.

Production High — Alterations effected in Chrysler, Dodge, DeSoto and Plymouth models certainly were not dictated by any serious resistance from buyers, for production has been holding to a peak of better than 6000 cars a day and dealers' stocks are far below normal. For example, of the 3350 Chrysler-Plymouth dealers, 73 per cent have no more than one demonstrator of each make in stock, and half of them do not have even one demonstrator. Average among all dealers is about three cars in stock, and only 2 per cent of the outlets have as many as ten on their floors. In prewar years, if a large dealer did not have 15 models in hand he felt it difficult to do business. The Chrysler Division claims it has about 150 "open" points where new dealerships might be established if there were sufficient cars to go around. This year, dealers will receive a minimum of 40 cars each, in contrast to 33 last year. Division chief D. A. Wallace thinks it will take two more years of continued heavy production to bring the level of postwar cars to where it should be before a softening of the market develops. He thinks this level is 30-35 million vehicles, and adds that with 12 million cars now ten years or more old and in need of replacement an annual replacement market of 3 million is probable eventually.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1949	1948
January	445,092	422,236
February	443,734	399,471
March	543,711	519,154
April	569,728	462,323
May	508,101	359,996
June	628,000*	454,401
Six mos.	3,138,366*	2,617,581
July		489,736
August		478,186
September		437,181
October		516,814
November		495,488
December		514,337
12 mos.		5,549,323

*Preliminary.

Estimate for week ended:

	1949	(Same week) 1948
June 25	153,001	95,027
July 2	144,822	112,307
July 9	116,878	98,700
July 16	146,000	120,741

Estimates by Ward's Automotive Reports

Waterproof Ignition — Chrysler is heralding its new waterproof ignition system as a distinctive first in the industry. Spark plug covers, comprising a steel bowl and a flexible neoprene cap for the terminal end, protect the insulators from splashed water and keep them free of oil and dirt. The neoprene is able to withstand the relatively high temperatures around the plug and has good resistance to the corona effect, by which electric current is lost through discharge. Neoprene-covered spark plug wiring also is used to waterproof the ignition system further, eliminating braided wiring which absorbs moisture. Vinylite caps seal the connections of the ignition cables to the coil and distributor cap towers.

This waterproofing, an outgrowth of wartime experience in making combat vehicles impervious to weather, prevents moisture from penetrating spark plugs, wiring or distributor, leading to short circuits and firing of the plugs.

Evansville Gets New Project — Manufacture of Dodge, DeSoto and Chrysler station wagon bodies has been added to assembly of Plymouth passenger cars at Chrysler's Evansville, Ind., plant, 40 per cent of the plant's 500,000 sq ft of space being given over to the new project, the third major activity to be included in operations there. First was assembly of Plymouths, then chassis and body wire harness systems for all Plymouths, including those assembled in Detroit, Los Angeles and San Leandro, Calif.

The station wagon body fabrication, currently running 25 a day, includes not only assembly but also many manufacturing processes such as milling, filling and varnishing of wood parts, and welding, finishing, cleaning, painting and drying of steel components. Ash frames and wood panels come from the Chrysler Pekin Wood Products plant at Helena, Ark., while stampings and finished parts are furnished both by suppliers and the corporation's own manufacturing divisions in Detroit. Employment at Evansville now is about 1600, compared with 800 in 1941, and Plymouth assemblies are averaging 475 daily, against 375 in 1941.

Ford To Expand Die-Casting

FORD is readying plans for what appears to be a major installation of die-casting equipment to produce hardware and other die-cast parts re-

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TEARDROP CAR: One of many foreign and American automobiles at the International Auto Show at Oakland, Calif., was this American-built Gordon car. Designed, engineered and built by Gordon Hansen, the car has four independently sprung wheels set in a diamond shape. It has a short turning radius of only 12 feet. The teardrop-shaped vehicle is powered with a 100-hp engine. Cost to build, exclusive of labor, is estimated at $5000. NEA photo

quired in passenger cars and trucks. It is not known for sure just where the operation will be located, preliminary discussions and requests for quotations emanating from one of the company's village industry plants. According to trade gossip, the project will call for about a carload of zinc daily which would indicate fairly hefty production schedules. Also contemplated are the necessary finishing and plating facilities to process parts requiring chrome plate.

Buick Dealers See New Models

FIRST postwar field sales organization meeting to be held by Buick drew 300 to Flint last week to get their first glimpse of the new Riviera sports models and the forthcoming Series 40 Special, the latter an entirely new lower-priced design which will be shown to the press this week. Highlights of the field meeting was a visit to the General Motors Proving Ground at Milford, Mich., also to be the site of the press gathering, where an opportunity was given to put the new cars through their paces on all types of terrain. Price on the Riviera steel-top sports car was announced as $2985, and standard equipment includes dynaflow transmission, pushbutton window controls and a number of other accessories.

Buick production passed the 200,000 mark in the first six months of the year, a point which was not reached last year until Sept. 24. First-half output in 1948 was 135,296. June assemblies alone totaled 36,891, up 84 per cent from a year ago. Demand for the dynaflow transmission continues to exceed production capacity, output last month being 26,907, or 73 per cent of car production. This held to the pace of the first half of the year in which time 147,705 transmissions were supplied, equal to 74 per cent of car assemblies.

Offer Steel-Top Models

BOTH Cadillac and Oldsmobile have made formal announcement of initial production on steeltop sports models, the former's version being called a Coupe de Ville, the latter a Holiday Coupe. Price on the Cadillac design is $3497, identical with the convertible. Interior of the roof is covered with simulated leather and exposed top bows are in a chrome finish. Absence of a top-operating mechanism increases interior roominess somewhat and also provides additional luggage space.

Still to be placed in production are similar types by Pontiac and Chevrolet, the former to be called the Catalina and the latter the Bel Air. Both have decided to hold off production of special body types until they can catch up with demand for regular models, perhaps until 1950. Chevrolet built more cars and trucks in June than in any other month in the history of the division, the total of 151,466 surpassing that for May, 1929 by 1370 units.

UAW Meeting Quiet

ANNUAL convention of the UAW-CIO in Milwaukee last week was accompanied by few of the fireworks which have exploded at earlier meetings of the group. President Walter P. Reuther and his group of international officials seemed to have a firm grip on the proceedings and leftwing elements present were unable to make much headway. Much of the discussion centered over the union's pension campaign which is currently stalemated at Ford and still to be placed on the agenda in Chrysler wage negotiations.

An interesting sidelight was action taken to reprimand union members reported working off-hours in so-called "moonlight" tool and die shops. Protests developed among members of a Detroit tool and die local which claimed there were 3000 unemployed tool and die workers in the area whose changes of employment were being jeopardized by skilled craftsmen in production plants who were working evenings in the "moonlight" die shops. Resolution was passed prohibiting any fully employed UAW craftsman from accepting part-time employment in another plant where the union has a contract, under penalty of being charged with conduct unbecoming a union member.

Hudson Sales Up

HUDSON sales in the first six months were at a 20-year peak, retail deliveries totaling 82,910, an increase of 33 per cent over the same period of 1948. Meanwhile, the company's steel problems have been considerably relieved, with increased shipments from regular mill sources making it possible to suspend operations of a hand sheet mill in Pennsylvania. At one period Hudson was able to obtain only about 4000 tons out of a needed 17,000 tons of steel from established mills, the rest having to come at considerable cost under conversion arrangements. Inventory of "conversion" steel has not been entirely consumed but is approaching the end.

The industry was shocked at the sudden passing of Hudson vice president in charge of sales, George H. Pratt, 60, who died July 8 while addressing Los Angeles dealers.

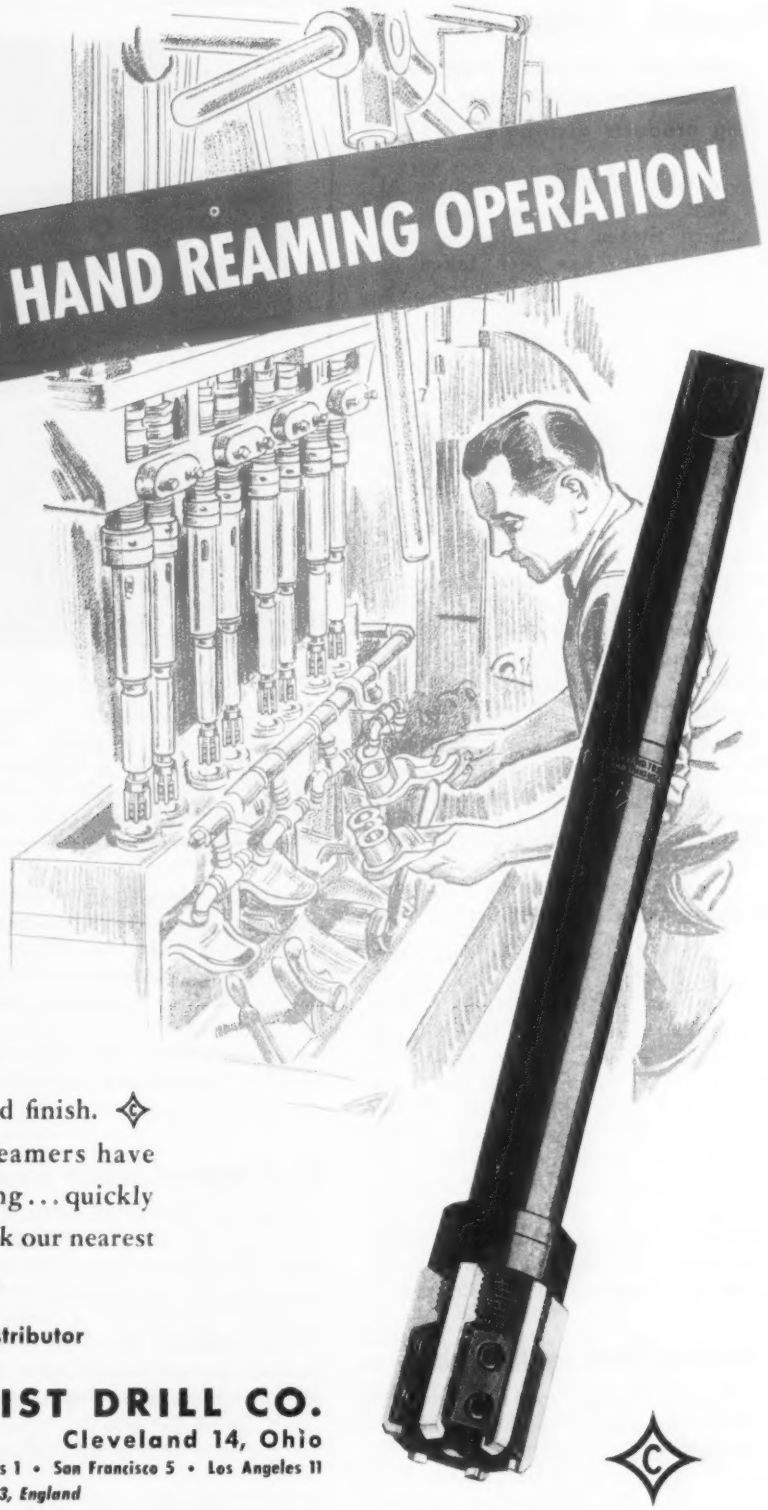
Nash To Open Toronto Plant

NASH expects to open its Toronto, Ont., manufacturing and assembly plant early next year, at which time equipment will have been completed. The plant was purchased in 1946 from Ford and the latter company will have finished removal of its equipment to a new site in Toronto by September. Thomas S. Adams, for many years with Ford foreign operations, becomes manager for Nash in Canada.

For Sale: Train of Tomorrow

GENERAL Motors will sell its million-dollar "Train of Tomorrow" when the Chicago Railroad Fair closes Oct. 2.

HOW TO SAVE A HAND REAMING OPERATION



...and increase tool life from 100 to 400 holes per grind

When a motor truck company changed to this ***Cleveland*** High Speed Adjustable Reamer, they reported an increase in tool life from 100 to 400 holes per grind. And they *eliminated a succeeding hand reaming operation* which had been necessary to produce the required finish. ***Cleveland*** High Speed Adjustable Reamers have many advantages. They are rigid . . . strong . . . quickly adjusted . . . accurate . . . economical. Ask our nearest Stockroom for full information, or . . .

Telephone Your Industrial Supply Distributor

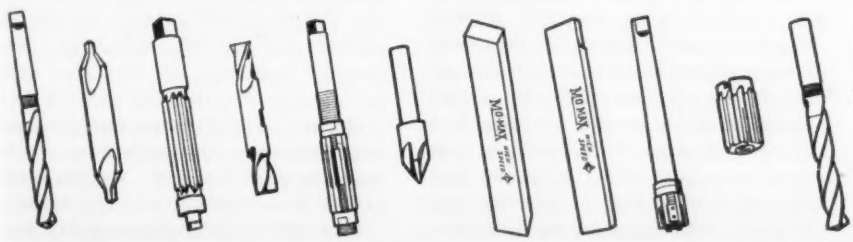
THE CLEVELAND TWIST DRILL CO.

1242 East 49th Street • Cleveland 14, Ohio

***Stockrooms:* New York 7 • Detroit 2 • Chicago 6 • Dallas 1 • San Francisco 5 • Los Angeles 11**

E. P. Barrus, Ltd., London W. 3, England

ASK YOUR INDUSTRIAL SUPPLY DISTRIBUTOR FOR THESE AND OTHER *Cleveland* TOOLS



Reynolds Options Firm

Aluminum interest may buy Southern States, regional building products distributor

SIX-MONTH option to purchase 51 per cent of the common stock of Southern States Iron Roofing Co., Savannah, Ga., has been taken by Reynolds Metal Co., Richmond, Va. Simultaneously, Southern States has agreed to increase distribution and sales of Reynolds aluminum building products in the South. Several new branches will be opened by Southern States which will continue to distribute its present line, including steel and aluminum roofing.

The company operates branches in Birmingham, New Orleans, Hattiesburg, Miss., Raleigh, N. C., Nashville, Tenn., Columbia, S. C., Albany, Ga., Orlando and Jacksonville, Fla. A fabricating plant and distributing warehouse are in Savannah where the general offices are located.

In the past 34 years Southern States has built up a $14 million-a-year business. F. O. Wahlstrom is president. Richard S. Reynolds Jr. is president of the Reynolds Metal Co.

GETTING ACQUAINTED: To acquaint its personnel with its diversified activities, Dravo Corp., Pittsburgh, takes employees to various projects on which it is engaged. Here are some of its office workers visiting a substructure for a new bridge over the Monongahela river at Belle Vernon, Pa.

Movies Curb Accidents

NATIONAL Supply Co. is promoting safety at its Ambridge, Pa., plant by use of motion pictures. The equipment is set up and the pictures shown to groups in the particular area of the plant where the men work—and on company time. In the 18 months since this program started the accident frequency has been reduced considerably. Part of this improvement can be attributed to the program. Most of the films, which run about 15 minutes, are obtained from the National Safety Council.

Sintering Plant for Bethlehem

SINTERING plant with a capacity of 90,000 tons will be built by the Bethlehem Steel Co.'s Lackawanna, N. Y., plant. Siegfried Construction Co., which has the foundation contract for the multimillion dollar addition to the cold strip and sheet rolling mill at Lackawanna, will build the sintering plant foundation. Plant is scheduled for completion by mid-1950.

RFC Aids Manufacturing Plants

THESE loans to metalworking companies were outstanding in deals completed by the Reconstruction Finance Corp. in May:

Grenby Mfg. Co., Plainville, Conn., working capital for manufacture of electronic instruments, $986,000 for six months; Northrop Aircraft Inc., Hawthorne, Calif., working capital for airplane manufacture, $5 million for two years; Richmond Radiator Co., Richmond, Va., working capital for manufacture of heating, plumbing and air conditioning euipment $1.5 million for five years.

Given Highest Safety Award

NATION's highest safety award was presented to the U. S. Steel employees at Lorain Works of National Tube Co. for an unbroken record of 2,164,841 man-hours of work without a disabling accident. "Distinguished Service to Safety Award" was presented by William A. Irvin, chairman of the board of trustees of the National Safety Council.

Building Peak in August

MIDYEAR review of building prospects for 1949 reveals labor requirements for new construction probably will reach peak in August. Bureau of Labor Statistics predicts this peak because building contractors are expected to have about 2.3 million employees at work on new projects. The anticipated peak will exceed last year's August high of 2,253,000 and will represent a gain of 300,000 over the May, 1949, employment estimate. Residential building is expected to account for a third of employees working on new construction.

Horton Buys Jacobs Unit

HORTON Mfg. Co., Ft. Wayne, Ind., maker of washers, ironers and driers, has purchased the Home Laundry Equipment Division of F. L. Jacobs Co., Detroit.

Horton is moving all tools, dies, equipment and inventory of the Jacobs division to its Ft. Wayne plant where the company will start manufacture of the new Horton automatic washer. This product will replace the Jacobs Launderall which is being dropped from the field.

U. S. Firm Builds U. K. Refinery

FOSTER WHEELER Corp., New York, has been awarded a contract calling for construction of a large oil refinery at Fawley, England.

Foster Wheeler will provide mechanical design engineering and will construct nine processing units. With the exception of tankage marine facilities and administration and laboratory buildings, it will also erect all off-side facilities, including a complete steam plant. Preliminary work is underway on the project for Anglo-American Oil Co. Ltd., British affiliate of Standard Oil of New Jersey.

The $150 million refinery will have a capacity of 110,000 barrels a day.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Interstate Engineering Corp., El Segundo, Calif., has been awarded contracts totaling $400,000 by the Navy and Air Force, bringing its backlog of orders for the armed services to $1.5 million. Orders are for precision airplane and armament parts.

—o—

Cochrane Corp., Philadelphia, has appointed Boiler Equipment Service Co., Atlanta, sales and engineering representatives for industrial water treating equipment and steam specialties in Alabama, except Mobile and Baldwin counties.

—o—

Texas Engineering and Mfg. Co. has received additional subcontract work from Boeing Airplane Co. and Consolidated Vultee Aircraft Corp. TEMCO's Boeing contract is for 119 production tools for the six-jet B-47. The new Convair contract is for hard chrome plating of piston parts and rods for the six-engine B-36.

—o—

Balmar Corp., Baltimore, subsidiary of Franklin Railway Supply Co., has acquired the business of N. A. Strand & Co., Chicago. The N. A. Strand Co. Division will continue to manufacture the Strandflex line of flexible shaft machine tools.

—o—

SKF Industries Inc. now has 352 employees who have been associated 20 years or more with the company. All 20-year employees are given gold watches.

—o—

Blaw-Knox Co., Pittsburgh, has received large orders or letters of intent from foreign companies for rolling mill equipment, chemical plants, construction equipment and other products, Chester H. Lehman, executive vice president, announced when he returned from a six weeks' trip to Europe.

—o—

Massachusetts Institute of Technology, Cambridge, Mass., reports a gift of $1 million from Alfred P. Sloan Jr., chairman of the board of General Motors Corp., for construction of a Metal Processing Laboratory building.

—o—

Electrical Industrial Truck Association has moved its offices from Long Island City, N. Y. to 3701 N. Broad St., Philadelphia 40. William Van C. Brandt, formerly connected with Electric Storage Battery Co., Philadelphia, is the new managing director of the association.

—o—

Wolverine Tube Division of Calumet & Hecla Consolidated Copper Co., Detroit, has opened a new southeastern district sales office in Atlanta. A. R. Kaspark established the office which is at 788 Spring St. N. W.

—o—

South Wind Division of Stewart-Warner Corp., Indianapolis, has entered into the custom production of finished machined parts.

—o—

Drum Jack Corp. has been incorporated as a subsidiary of Cleveland Pneumatic Tool Co. The new corporation will manufacture and sell heavy-duty automobile jacks; its offices will be located at those of Cleveland Pneumatic Tool, Cleveland.

—o—

G. A. Gray Co., Cincinnati, builder of milling planers and planer type milling machines, has announced Ford Machinery Co., Toledo, as its northwestern Ohio distributor; Frank T. Goetz Machinery Inc., Cleveland, for northeastern Ohio; Martin Supply Co., Tulsa, for Oklahoma; and Hoffman & Heartt, Los Angeles, for southern California.

—o—

Society of Automotive Engineers Inc. has brought out its 1949 *SAE Handbook.* Included among 31 new automotive standards and specifications is one which sets up for the first time uniform names for trucks, busses and tractor-trailer combinations. An important contribution is in the field of steel, nonferrous and other material specifications.

—o—

E. W. Bliss Co. has transferred its manufacturing operations at Englewood, N. J. to Hastings, Mich., but will continue its eastern parts sales and administrative offices at 19 E. 47th St., New York. The company also has announced the appointment of Wegner Machinery Corp., Long Island City, N. Y., as its authorized service dealer in metropolitan New York, Connecticut and New Jersey.

—o—

Columbia Tool Steel Co., Chicago Heights, Ill., has opened a new sales office and warehouse in St. Louis to handle its stock of high speed, alloy and carbon tool steels.

—o—

Ingersoll Steel Division, Borg-Warner Corp, Chicago plant has completed 1 million man-hours of work in which there was not a single lost-time accident over a five and a half month period.

—o—

Avondale Marine Ways Inc., New Orleans, has been awarded a contract of $135,480 to build 40 steel dredge pontons for the U. S. Army Engineers, Memphis district. The *Grand Lake,* a company-designed and built trawler type steel work boat, joined the marine fleet of Superior Oil Co. and will operate along the Louisiana Gulf coast.

—o—

Landis Machine Co., Waynesboro, Pa., is increasing its research, office and manufacturing facilities 50,000 sq. ft. The company has also purchased a number of new and more productive machines and tools.

—o—

Hamilton-Thomas Corp., Hamilton, O., has acquired Smith & Mills Co., Cincinnati, manufacturer of crank shapers. To be known as Smith & Mills Division of the parent corporation, the former Cincinnati firm will produce its line of shapers at the Hamilton plant of Hamilton-Thomas.

—o—

Schauer Machine Co., Cincinnati, has been renamed Schauer Mfg. Corp. to identify its interest in automotive and radio equipment fields as well as in the machine tool industry. A manufacturer of speed lathes, rectifiers and automotive testing instruments, the company has introduced its new Charger-Guard battery boosters.

—o—

General Motors Corp. has been approved by the government for purchase of the wartime tank-manufacturing plant at Flint (Grand Blanc), Mich. for $2,404,456. GM has been operating the plant since the end of the war on a lease with option to purchase.

—o—

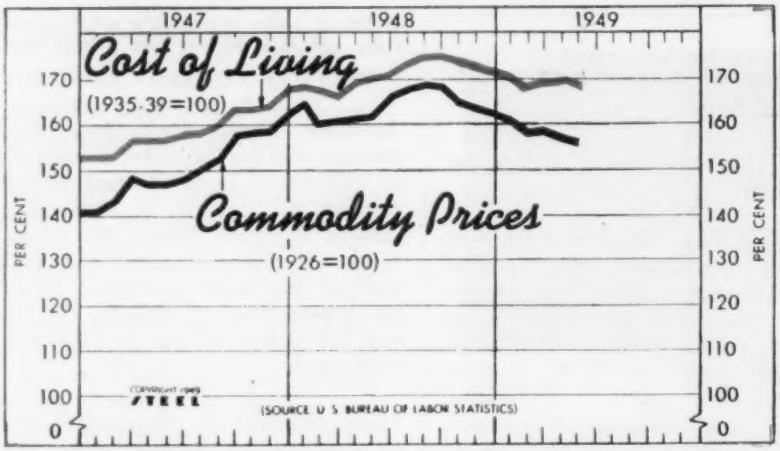
Institute of Cast Iron Soil Pipe & Fittings Manufacturers has been organized, with J. J. Nolan Jr., vice president, Central Foundry Co., New York, president. The group comprises about 26 companies.

—o—

Chicago Association of Commerce & Industry reports that plans to invest a total of $11,158,000 in industrial developments in the Chicago area were announced in June by 24 firms. Investment total for the half year is $53,120,000, compared with $63,184,000 for the first six months of 1948.

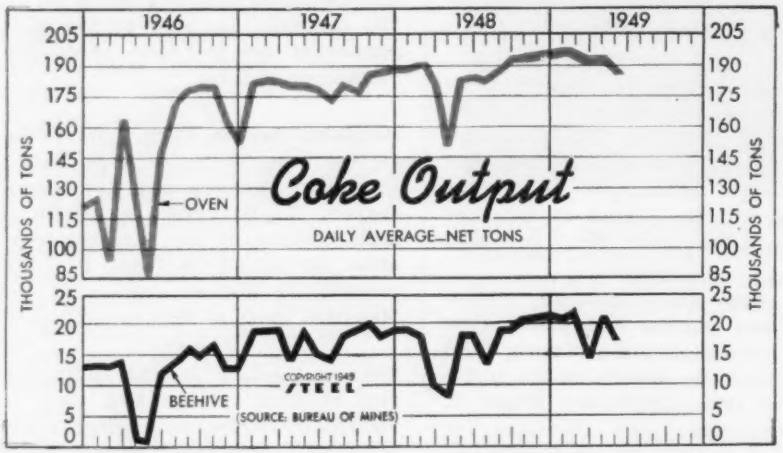
—o—

Metcon Inc. has been formed at Holmes, Pa., to engage in steel plate construction. Principals are W. C. and E. C. Aucott and C. A. Freitag.



Wholesale Commodity Price—Cost of Living Indexes

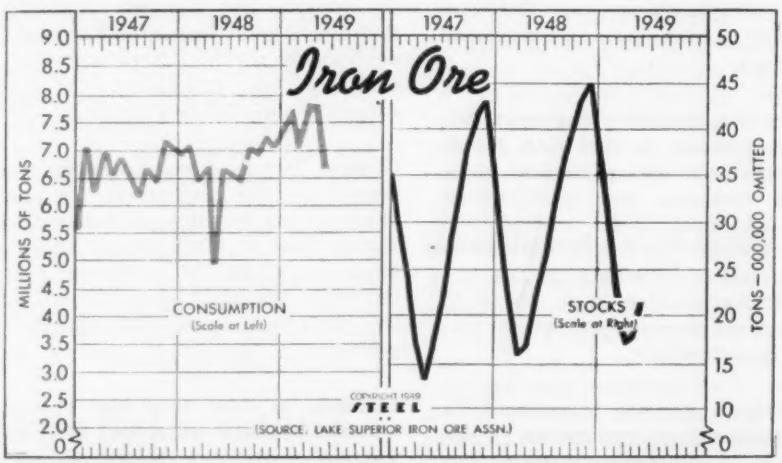
	—Commodities— (1926=100)			—Living Cost— (1935-39=100)		
	1949	1948	1947	1949	1948	1947
Jan.	160.6	165.7	141.5	170.9	168.8	153.3
Feb.	158.1	160.8	144.5	169.0	167.5	153.2
Mar.	158.4	161.4	149.5	169.5	166.9	156.3
Apr.	156.9	162.7	147.7	169.7	169.3	156.2
May	155.7	163.9	147.1	169.2	170.5	156.0
June	....	166.2	148.0	....	171.7	157.1
July	....	168.7	150.8	....	173.7	158.4
Aug.	....	169.5	153.7	....	174.5	160.3
Sept.	....	168.7	157.4	....	174.5	163.8
Oct.	....	165.2	158.5	....	173.6	163.8
Nov.	....	164.0	159.6	....	172.2	164.9
Dec.	....	162.3	163.2	....	171.4	167.0
Ave.	....	164.9	151.8	....	171.2	159.2



Coke Output

Bureau of Mines
(Daily Average Net Tons)

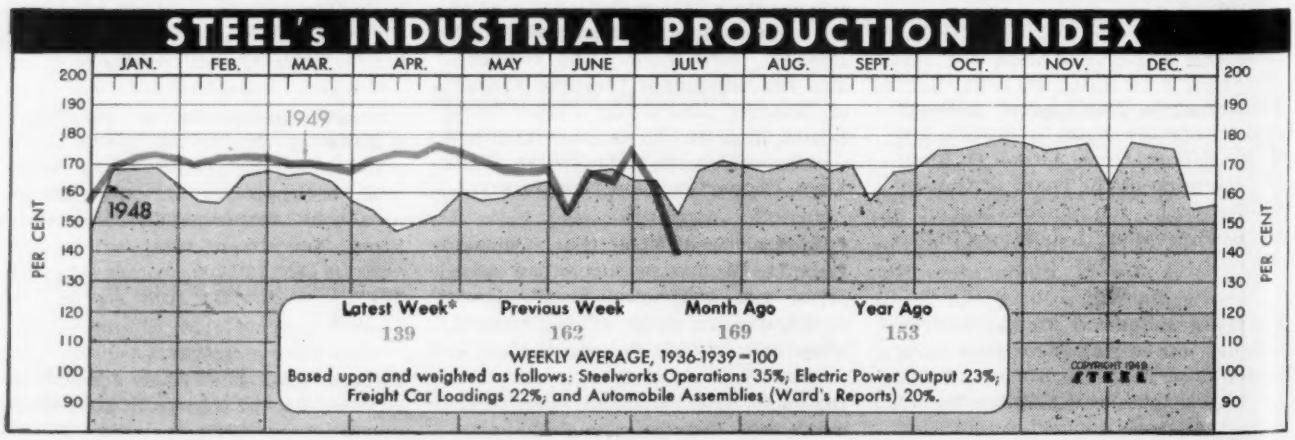
	Oven		Beehive	
	1949	1948	1949	1948
Jan.	196,000	189,191	20,121	19,588
Feb.	195,551	190,098	22,261	18,625
Mar.	192,183	182,340	14,030	10,485
Apr.	192,019	149,692	21,098	8,235
May	187,040	184,568	17,401	18,651
June	....	186,425	....	18,045
July	....	184,286	....	14,032
Aug.	....	188,468	....	19,751
Sept.	....	192,090	....	19,616
Oct.	....	192,440	....	20,083
Nov.	....	193,565	....	20,341
Dec.	....	195,670	....	20,588
Ave.	....	185,770	....	17,338



Iron Ore

(Lake Superior Iron Ore Assn.)
Gross tons—000 omitted

	Consumption		Stocks at Lake Erie Docks and Furnaces	
	1949	1948	1949	1948
Jan.	7,590	7,057	31,904	29,081
Feb.	6,992	6,440	24,981	22,628
Mar.	7,735	6,634	17,308	16,022
Apr.	7,322	4,976	17,803	17,125
May	6,656	6,656	21,508	22,058
June	....	6,577	....	26,965
July	....	6,479	....	32,611
Aug.	....	7,036	....	37,081
Sept.	....	6,965	....	40,923
Oct.	....	7,273	....	43,883
Nov.	....	7,058	....	45,160
Dec.	....	7,351	....	39,460
Total	....	80,504		



* Week ended July 9 (preliminary)

The Business Trend

LEVEL of industrial activity nosedived to the lowest point since Jan. 3, 1947, in the week ended July 9, reaching a preliminary 139 per cent of the 1936-1939 average. The index for the latest week is 23 points below the preceding week and follows hard on the heels of an 11 point drop a week earlier.

STEEL—Although some decline is normal during a holiday week, an unusually large reduction in the ingot rate was the principal factor responsible for the swift descent of the index. Steelworks operations were at 60 per cent of capacity in the week ended July 9, the lowest point since the week ended June 8, 1946. Increased production is scheduled for the following week but the immediate future for steel operations is beclouded by labor difficulties. Whether the ingot rate will rise or drop even further is contingent on the outcome of current efforts to bring about peaceful settlement of the differences between management and labor.

AUTOMOBILES — The holiday, heat and walkouts sum up the reasons for the drop in automotive assemblies to 116,878 units in the week ended July 9 from 144,822 in the preceding week. All builders, of course, lost one day's production because of the holiday but additional man-hours were lost at some plants due to heat walkouts and labor difficulty at the plant of a large body supplier. Schedules call for high assembly volume at all plants, but the automobile industry is also having its share of labor headaches. Steel has been stockpiled, just-in-case, but contract talks still have to be settled by leading builders. Further complicating matters is the decision to strike taken by employees at Detroit Edison, electric power supplier to the motor capital.

PRICES—The wholesale price index of the Bureau of Labor Statistics continued its gradual decline in the week ended July 5 to 152.7 per cent of the 1926 average. The index for the latest week is 2.1 per cent below four weeks earlier and 8.7 per cent below the comparable week in 1948.

CONSTRUCTION—Civil engineering construction volume totaled $138.5 million for the week ended July 7, 13 per cent below the volume for the preceding week and 18 per cent below the corresponding week last year. The cumulative total of about $4.1 billion for the first 27 weeks of 1949 is 16 per cent above the corresponding total in 1948.

INVENTORIES — Commerce Department reports business inventories at the end of May totaled $52.5 billion, a decline of $1.2 billion from April. About one-fourth of this decline was due to seasonal fluctuations and price declines were also a factor. Still, the department states the change represents a sizable decline in the physical volume of stocks. Manufacturing inventories were down to $30.8 billion from $31.3 billion a month earlier.

RAILROADS—Estimated net income of Class I railroads in May amounted to $32 million as compared with $65 million in the like month in 1948, according to the Association of American Railroads.

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	60.0	80.0	87.5	89.0
	Electric Power Distributed (million kilowatt hours)	4,982	5,410	5,300	4,760
	Bituminous Coal Production (daily av.—1000 tons)	228	1,963	1,675	613
	Petroleum Production (daily av.—1000 bbl)	4,668	4,819	4,876	5,480
	Construction Volume (ENR—Unit $1,000,000)	$138.5	$180.9	$226.2	$168.7
	Automobile and Truck Output (Ward's—number units)	116,878	144,822	137,013	98,700
	*Dates on request. †1949 weekly capacity is 1,843,516 net tone. 1948 weekly capacity was 1,802,476 net tons.				
TRADE	Freight Car Loadings (Unit—1000 cars)	610†	644	808	756
	Business Failures (Dun & Bradstreet, number)	153	177	174	88
	Money in Circulation (in millions of dollars)‡	$27,659	$27,426	$27,484	$28,142
	Department Store Sales (changes from like wk. a yr. ago)‡	−11%	−6%	−8%	+28%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$12,558	$13,499	$13,191	$12,258
	Federal Gross Debt (billions)	$252.5	$251.6	$251.6	$251.9
	Bond Volume, NYSE (millions)	$9.9	$12.4	$16.1	$15.1
	Stocks Sales, NYSE (thousands)	3,573	3,334	4,604	4,232
	Loans and Investments (billions)†	$62.6	$62.6	$62.3	$62.6
	United States Gov't. Obligations Held (millions)†	$34,149	$34,515	$34,035	$34,666
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Composite Finished Steel Price Average	$91.82	$91.82	$92.09	$80.27
	STEEL's Nonferrous Metal Composite‡	168.0	164.6	169.6	201.3
	All Commodities†	152.7	152.9	155.9	167.2
	Metals and Metal Products†	165.6	165.7	167.3	159.2
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100.				

Men of Industry

SWAN E. BERGSTROM

STANLEY C. LORE

JOHN J. RADIGAN

Swan E. Bergstrom, sales manager, Cincinnati Milling Machine Co., Cincinnati, has been elected vice president of that company, and **George W. Binns** and **Lester F. Nenninger** were elected vice presidents and directors of Cincinnati Milling & Grinding Machines Inc., a sales subsidiary. **Carl F. Roby,** vice president of the parent company, was elected a director. Mr. Binns has been active in development of the company's grinding machine business and executive head of various departments. Mr. Nenninger has served in the company's engineering and development work for many years, and since 1943 has been works manager.

—o—

R. G. Caulley has been named vice president in charge of sales, Peninsular Grinding Wheel Co., Detroit. Formerly general sales manager with Peninsular, he has held executive positions with Republic Steel Corp. and Fruehauf Trailer Co.

—o—

Max M. Muller has been appointed works manager of Ohio operations for Basic Refractories Inc., Cleveland. Formerly general manager, Swiss Grinding Wheel Works Ltd. of Switzerland, Mr. Muller succeeds **N. E. Hanson,** recently appointed works manager of the company's Western Division, and he will make his headquarters at Basic's Maple Grove, O., plant. **A. M. Weaning,** who has been acting works manager in Ohio, has been promoted to assistant to **Tom W. Ryan,** recently named as manager of operations.

—o—

Turco Products Inc., Los Angeles, announces appointment of **F. E. Warnes** as director of sales promotion. He formerly held the position of sales supervisor for the Pacific Northwest.

—o—

Stanley C. Lore has been appointed general manager, J. B. Kendall Inc., Norfolk, Va. He succeeds the late **Mason B. Peebles.** Mr. Lore has been associated with Carnegie-Illinois Steel Corp. for 14 years where, for the past nine years, he has been with the sales department covering the Richmond, Va. and Norfolk territory.

—o—

Thomas J. Kehane has been elected assistant vice president and general sales manager, Worthington Pump & Machinery Corp., Harrison, N. J. He joined the company in 1915, served as commercial vice president, Pacific Coast, and for the past two years as Pacific Coast regional vice president of the Navy Industrial Association.

—o—

Herbert B. Jeffrey, executive department chief co-ordinator, Great Lakes Steel Corp., Ecorse, Mich., has been appointed assistant to the president. **Ross Wilkins,** assistant vice president for Great Lakes Steel, will also be assistant general manager of sales. **Ralph Welles,** Hanna Furnace Corp.'s eastern district sales manager since 1945, has been appointed to succeed the late **F. L. Kennedy** as eastern district manager for Great Lakes Steel. He will continue to represent Hanna, which like Great Lakes is a unit of National Steel Corp.

—o—

Robert F. Hodgson has been appointed chief engineer, Hydraulic Equipment Co., Cleveland. He joined the company four years ago, and has served in the engineering and sales departments. He formerly was connected with the engineering department of Wright Aeronautical Corp.

—o—

John J. Radigan has been appointed director of industrial relations, E. W. Bliss Co., Detroit. Associated with Bliss since 1946, he was previously assistant director of personnel of all plants. Prior to two years' service in the U. S. Navy, Mr. Radigan was employed in labor relations work at the Delco Division in Bloomfield, N. J., for General Motors Corp.

—o—

Sands G. Falk has been appointed manager of foundry sales, Falk Corp., Milwaukee, succeeding **John S. Wilkinson,** who will become foundry sales consultant when he returns from a European trip in October.

—o—

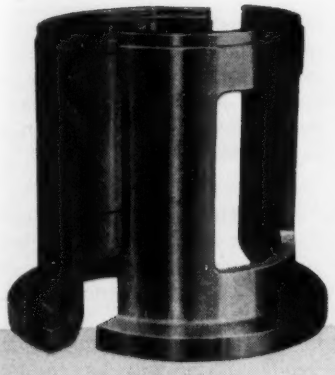
Martin P. Teller has been elected vice president in charge of engineering at Gimpel Machine Works, Philadelphia. He formerly was valve engineer, Valve Division, for many years with Schutte & Koerting Co.

—o—

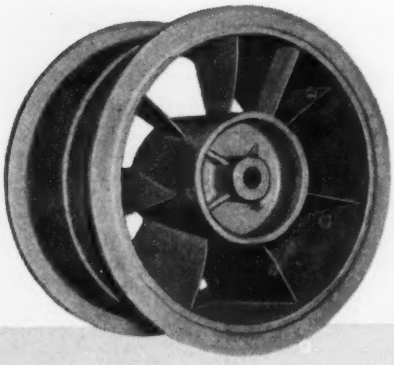
Arthur M. Watson has been appointed vice president in charge of sales, S-M-S Corp., Detroit. He has had many years' experience in the resistance welding field, having formerly been associated with Sciaky Bros. in Chicago, and more recently in resistance welding and metallurgical products as sales manager, Mid-Western Division, P. R. Mallory & Co. Inc.

—o—

George H. Natzel has been appointed Pacific regional manager for Oldsmobile Division, General Motors Corp. He has been zone manager at Los Angeles, and will now maintain regional headquarters at Oakland, Calif. A.



ACCURACY

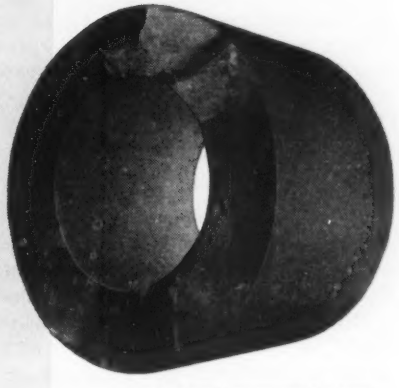


STRENGTH

WEAR RESISTANCE

What *Qualities* do you look for in Non-Ferrous BEARINGS and CASTINGS?

You want ALL FOUR, of course . . . and you get ALL FOUR qualities plus better performance and greater long-range economy when you specify N-B-M Bearings and Castings.



SHOCK RESISTANCE

The bearings and castings shown above are typical results of these complete—and modern—facilities that you'll find at National Bearing Division:

Research—

American Brake Shoe's extensive research labs, containing the latest in testing equipment, are always at the disposal of N-B-M for all types of research on customers' problems.

Engineering—

The N-B-M Engineering staff is fully qualified to work either for or with you in solving problems of stress, alloy or over-all design of bearings and castings.

Production—

From precision molding to final machining, N-B-M has the latest manufacturing techniques that assure you of products with maximum strength, precision, wear-resistance and density.

Quality Control—

Modern X-Ray, Photomicrographing equipment, and other latest testing devices provide a surety for you of castings that meet and often exceed your specifications.

Yes, if qualities that insure longer, more economical service are important for the Bearings and Castings used in your plant or product, call in your nearest N-B-M Representative. He will be glad to give you specific information on how this complete N-B-M service can be applied to your problems.

N B M

AMERICAN Brake Shoe COMPANY

NATIONAL BEARING DIVISION

ST. LOUIS 10, MO. • MEADVILLE, PA.

PLANTS IN: ST. LOUIS, MO. • MEADVILLE, PA. • NILES, OHIO • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

H. Brandel has been named production manager of the division at Lansing, Mich., succeeding **P. J. Monaghan,** who will take over a new assignment in the sales department. **Floyd V. Burr,** standards supervisor, has been promoted to assistant production manager at Lansing, and **J. J. Edwards,** general methods engineer, to general supervisor of standards and methods.

—o—

Fred McMeans has been appointed representative for the province of British Columbia, Canada, for L. J. Wing Mfg. Co., New York. He will maintain headquarters at Vancouver, B. C. Mr. McMeans has wide experience in both operation and design of heat and power equipment in marine and land installations. **Albert D. Becker** has been appointed representative for the eastern section of New York, Vermont and in Berkshire County, Mass. He will maintain headquarters at Albany.

—o—

J. G. Kreis has been appointed purchasing agent, Taylor-Wharton Iron & Steel Co., with plants at Easton, Pa., and High Bridge, N. J. He also continues in his duties as purchasing agent of Weir Kilby Corp., with plants at Cincinnati and Birmingham. Mr. Kreis will have headquarters at Cincinnati. He has been purchasing agent for Weir Kilby Corp. since 1918.

—o—

James D. Cunningham, president, Republic Flow Meters Co., Chicago, is the 1950 nominee for president of the American Society of Mechanical Engineers, New York. Formal election will take place in the fall and Mr. Cunningham and the new slate of officers will begin their terms at the end of the ASME annual meeting in New York next December. Mr. Cunningham will succeed **James M. Todd,** consulting engineer of New Orleans.

—o—

Charles A. Mitchell, who formerly served in the Cincinnati district for Hagan Corp., has been appointed in charge of a new subdistrict office at Baton Rouge, La., covering that state and western Mississippi. In his new work he is associated with Joseph W. Eshelman & Co. Inc., which represents Hagan and other subsidiaries in the South.

—o—

James H. Carmine, vice president of distribution, Philco Corp., Philadelphia, for the past two years, has been elected executive vice president. He is also a member of the executive, management and finance committees of the corporation.

—o—

J. H. Graebing, formerly purchasing agent in charge of the Mill Supply Division, Republic Steel Corp., Cleveland, has been promoted to purchasing agent for alloys and refractories, succeeding the late **Ralph Bowman.** Mr. Graebing will be succeeded by **J. W. Lowry,** a buyer in the Mill Supply Division.

—o—

Harold L. Gruehn, formerly sales representative in the Milwaukee district office of Allis-Chalmers Mfg. Co., has been named midwest region dealer supervisor, with headquarters in Chicago.

—o—

Superior Steel Corp., Pittsburgh, announces appointment of **W. B. Holt** as assistant to the vice president in charge of operations, **Karl W. Grube** as general superintendent, and **S. S. Rickley** as chief engineer. Formerly general superintendent, Mr. Holt has been connected with the company for 45 years, and has served as both assistant works manager and production manager. Mr. Grube joined Superior in 1946, having previously been with American Steel & Wire Co., Cleveland, and for two years served as superintendent of engineering and maintenance. Mr. Rickley has served in various capacities in the engineering department since 1945.

—o—

Edward X. Tuttle has been elected vice president in charge of new business for Turner Construction Co., with supervision of contract negotiations in its four offices, New York, Boston, Chicago, and Philadelphia. His headquarters will be in New York. Mr. Tuttle succeeds **J. P. H. Perry,** who continues as vice president and consultant on new business.

—o—

Harrie S. Taylor has been elected president, Oglebay, Norton & Co., Cleveland, succeeding **Crispin Oglebay,** resigned to become chairman of the board. **Robert C. Norton,** for many years vice president and treasurer, has relinquished these positions to become vice chairman. **Henry P. Rankin, E. W. Sloan Jr., Fred R. White Jr.** and Mr. Taylor have been added to the board of directors. The remainder of the board consists of **Arthur C. Bishop,** recently resigned company secretary, **Laurence H. Norton,** former assistant treasurer, and **Courtney Burton.** Mr. Rankin, formerly a director and official of Johns Manville Corp. and later president of Di-Noc Mfg. Co., has been retired for the past few years. Vice presidents are Messrs. Burton, Sloan and White, and Mr. Sloan will also serve as treasurer and **Gordon C. Nichols** as secretary.

—o—

A. E. Barker, former mideastern district sales manager, Firth Sterling Steel & Carbide Corp., McKeesport, Pa., has been promoted to assistant to **J. W. Kinnear Jr.,** president. Mr. Barker has been associated with Firth Sterling for 43 years, starting

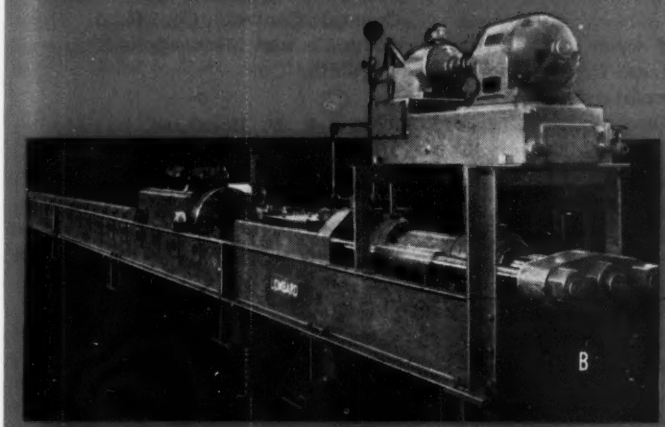
JAMES D. CUNNINGHAM

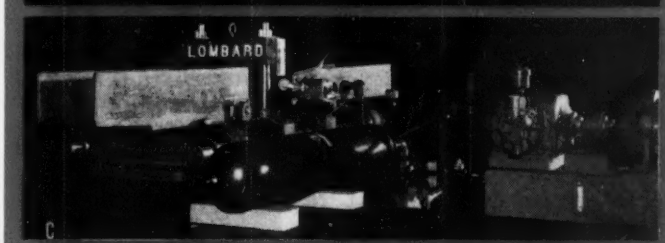
W. B. HOLT

A. E. BARKER

LOMBARD

All Lombard equipment is designed to meet your particular requirements. We invite you to investigate our facilities and products. All inquiries will receive courteous and prompt attention.



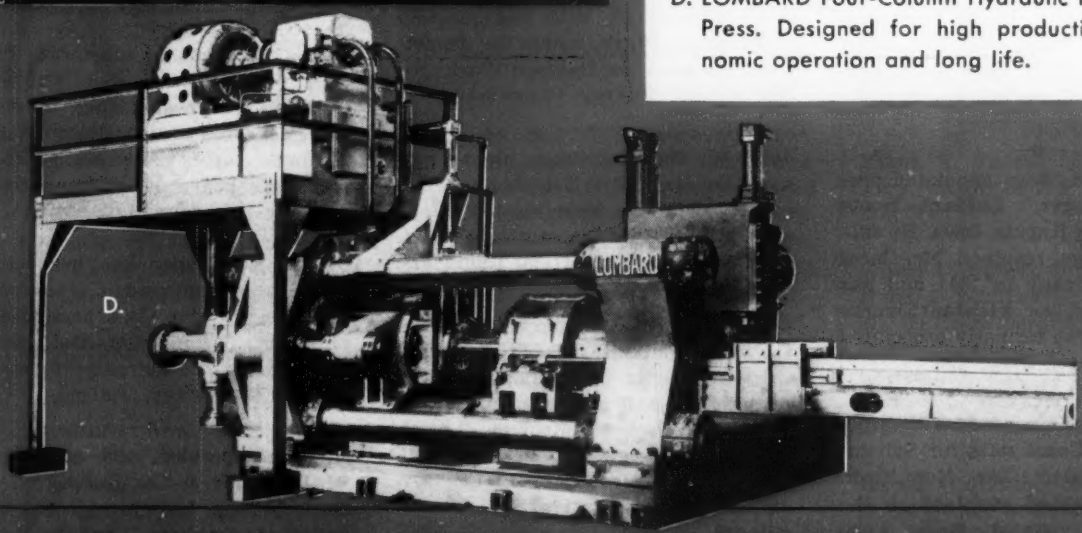


A. LOMBARD Hydraulic Press designed especially for baling jute.

B. LOMBARD Hydraulic Stretcher. Equipped with powered carriage and de-twisting head.

C. LOMBARD Hydraulic Test Bar Shear for cutting hot alloy steel bars while in motion.

D. LOMBARD Four-Column Hydraulic Extrusion Press. Designed for high production, economic operation and long life.



LOMBARD CORPORATION

Engineers and Designers

EMPIRE BUILDING · YOUNGSTOWN 3, OHIO

Equipment Manufactured by United Engineering and Foundry Co., Pittsburgh, Pa.

with **E. S. Jackman & Co.**, a Firth Sterling agency in Chicago. In 1933 he took charge as manager of the combined New York and Philadelphia districts for the corporation, which position he maintained until his recent appointment as assistant to the president.

—o—

C. T. Posey has been appointed field engineer in the midwestern area for Arcos Corp., with headquarters at Chicago. He will assist the Arcos distributors in that area, Machinery & Welder Corp. and C. E. Phillips & Co., in their stainless steel electrode sales activities.

—o—

E. J. Bjerenson has been appointed direct factory representative for the southeastern states, with headquarters in Orlando, Fla., for E. F. Griffiths Co., Philadelphia.

—o—

Mauray I. Cohen, president, National Association of Steel Exporters Inc., New York, and a former national president of the Association of Steel Distributors Inc., of whose national affairs committee he is chairman, has announced his resignation from Harry Harris & Co., Kearny, N. J., and subsidiaries.

—o—

Gerald A. Fleet has been appointed district manager for American Well Works, Aurora, Ill. He will serve the New York district.

—o—

Ross G. Allen has been appointed secretary and treasurer, Southern States Iron Roofing Co., Savannah, Ga. He formerly was secretary and assistant treasurer. In his new position Mr. Allen takes over the duties of treasurer which have been performed by **J. W. McIntire,** executive vice president.

—o—

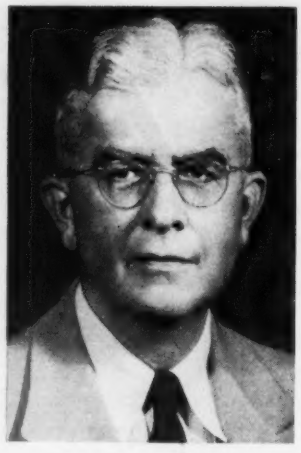
W. G. Gates has been appointed production manager, LaPlant-Choate Mfg. Co., Cedar Rapids, Iowa. He succeeds **C. H. Lage,** resigned. Mr. Gates joined the company in 1941 and has recently served as assistant works manager. He was formerly associated with Four Wheel Drive Co.

—o—

George R. Sommers, formerly director of Pacific Coast sales for Sylvania Electric Products Inc., New York, has been appointed assistant to the general sales manager, Radio Tube Division. **Ross Gessford,** formerly engineering specialist in cathode ray tubes, has been appointed chief engineer for the Television Picture Tube Division of the company.

—o—

Dr. W. A. Wesley, W. W. Sellers and **E. J. Roehl** were awarded the Founders Gold Medal for 1949 by the American Electroplaters' Society for their paper, "Electrodeposition of Nickel at High Current Density."



GEORGE H. WILLITS

—o—

George H. Willits has been named director of the patent section, General Motors Corp., Detroit, succeeding **Louis M. Spencer,** who is retiring with two other senior members of the staff, **George A. Lovett,** with the section 30 years, and **Hugh Miller,** with 25 years' service. Mr. Willits has been assistant director, patent section, since 1946. He joined General Motors in 1923.

—o—

Francis K. McCune, assistant to the general manager, apparatus department, General Electric Co., Schenectady, N. Y., has been appointed assistant general manager of the nucleonics department, with headquarters at Richland, Wash., where the department operates the Hanford Works for the Atomic Energy Commission.

—o—

John W. Davis, division plant engineer, Southern Bell Telephone & Telegraph Co., has been elected chairman of the Alabama section, American Institute of Electrical Engineers.

—o—

C. D. Gammello, manager, Wooster, O., branch store, U. S. Steel Corp.'s Oil Well Supply Co., Dallas, has been named district material supervisor for the Ohio-West Virginia district, with headquarters at Charleston, W. Va. He is succeeded by **B. E. Grey,** district representative at Zanesville, O.

—o—

Dr. E. Bruce Ashcraft has been appointed manager of chemistry research, Atomic Power Division, Westinghouse Electric Corp., Pittsburgh. **R. L. Brown** has been appointed division engineer in charge of engineering and development of instrument transformers, tap changers and large power centers for the Transformer Division at Sharon, Pa., succeeding **J. H. Chiles Jr.,** made engineering manager for the entire Transformer Division. **Samuel G. Hibben,** director of applied lighting, Lamp Division, Bloomfield, N. J., has been elected vice president of the Illuminating Engineering Society, and will take office Oct. 1.

—o—

H. Dale Cook has been named manager, Industrial Control Sales Division, Perfex Corp., Milwaukee. He succeeds **A. B. Meeg,** who joined Bell & Gassett Co. Before joining Perfex in 1944, Mr. Cook was with General Controls Co., R. L. Deppmann Co. and Minneapolis-Honeywell Regulator Co.

—o—

Frederick P. Bernhard, comptroller, International Nickel Co. of Canada Ltd., New York, has retired after 50 consecutive years of service with the company. He has been comptroller of International Nickel Co. of Canada Ltd. and its United States subsidiary, International Nickel Co. Inc., since 1933. Mr. Bernhard will also retire from his positions as a director and comptroller of Whitehead Metal Products Co. Inc., a U. S. subsidiary of INCO.

—o—

Permanente Products Co. has appointed **E. C. Boyce** roofing sheet product manager, with headquarters in the general sales office, Oakland, Calif. He formerly was with Southern States Iron Roofing Co., Savannah, Ga.

—o—

James T. Buckley, president, Philco Corp., Philadelphia, from 1939 to 1943, and who has since served as chairman of the executive committee, has been elected chairman of the corporation's board of directors to succeed the late **John Ballantyne.**

—o—

George F. Cooper has been named technical employment supervisor, Hercules Powder Co.'s personnel department, Wilmington, Del., assuming some of the duties performed by **Joseph M. McVey,** retired.

—o—

A. V. Stjepcevich, vice president of W. L. Moody & Co., Galveston, Tex., banking firm, has been elected to the board of directors, Lone Star Steel Co., Dallas.

—o—

Electro-Chemical Supply & Engineering Co., Paoli, Pa., announces complete re-organization, and election of the following officers: **Dr. C. R. Payne,** president; **J. W. Grant,** vice

W. A. WALKER

Elected vice president of accounting and a director, Carnegie-Illinois Steel Corp., Pittsburgh. Noted in STEEL, July 11 issue, p. 80

JOHN J. SUMMERSBY

Elected vice president in charge of sales, Worthington Pump & Machinery Corp., Harrison, N. J. Noted in STEEL, July 11 issue, p. 76

JAMES W. DICKEY

Appointed vice president and treasurer, Cleveland Chain & Mfg. Co., Cleveland. Noted in STEEL, July 11 issue, p. 80

president and sales manager; **W. A. Sesher,** treasurer and production manager; and **Walter L. Sheppard Jr.,** advertising manager and export sales manager.

—o—

Robert L. Lefevre has been elected commercial vice president, General Electric X-Ray Corp., Milwaukee. He is succeeded as marketing manager by **Willard J. Cox,** formerly assistant in that department.

—o—

Plasteel Products Co., Washington, Pa., announces appointment of **Earl L. Wiseman** as general sales manager. Mr. Wiseman is well known in the steel field as the designer of heavy duty ventilating jobs, such as the open-hearth building at the Kaiser plant in Fontana, Calif., and more recently he developed the use of plasteel as a roof deck material.

—o—

The New York office of the Lombard Corp., Youngstown, will be managed by **Frank R. DeBartolo,** vice president. The office will promote and develop export sales and cover the eastern territory in domestic sales. It is located in the Canadian-Pacific Bldg., Room 503, 342 Madison Ave.

—o—

Lawrence H. Cooper has been appointed vice president and general manager, Pacific Airmotive Corp., Burbank, Calif. He formerly was vice president in charge of the Eastern Division. **Floyd C. Gustafson** will succeed Mr. Cooper as manager, eastern branch, with headquarters at Linden, N. J.

—o—

Wayne C. Beitel, formerly with Webster-Chicago Corp., has joined Eicor Inc., Chicago, as sales manager of its Tape Recorder Division.

—o—

Detrex Corp., Detroit, announces the following appointments: **R. A. Emmett Jr.** has been made a special assistant to the general manager to supervise material control, production scheduling, inspection and safety. **J. Doyle Hamacher** has been made superintendent of the equipment manufacturing plant. He will also retain his previous title and duties as company plant engineer.

OBITUARIES . . .

C. H. Morse III, vice president, Fairbanks, Morse & Co., Chicago was killed in an airplane crash July 9 near Roanoke, Ill.

—o—

Arthur Dockter, general superintendent, De Laval Steam Turbine Co., Trenton, N. J., died June 20.

—o—

George A. Kraus, 60, Chicago district sales manager, Champion Spark Plug Co., Toledo, O., died June 24 from injuries sustained in an automobile accident near Eau Claire, Wis.

—o—

H. Kirke Becker, 60, president, Peters Machinery Co., Chicago, died of a heart attack June 21 en route to Europe.

—o—

Marcus Boyd, 66, president, Boiler Tube Co. of America, McKees Rocks, Pa., died July 5 following a brief illness. He was one of the original founders of Chandler-Boyd Co., Pittsburgh.

—o—

Orrin H. Baker, 64, sales manager, Railroad Materials & Commercial Forgings Division, Carnegie-Illinois Steel Corp., Pittsburgh, died of heart disease July 13 at his summer home in Burlington, Ont., Canada. He had been associated with Carnegie-Illinois and its predecessors since 1907.

—o—

Kenneth G. Olson, 58, sales manager for 17 years for Rundle Mfg. Co., Milwaukee, died July 7. He had been retired since 1939 because of illness.

—o—

Reginald A. Steel, 58, president, R. Steel & Sons, Long Island City, N. Y., died of a heart attack in his summer home at Oyster Bay, N. Y.

—o—

J. Howard Rowbotham, 63, secretary and treasurer, Belmont Iron Works, Philadelphia, for many years before he retired in 1940, died July 9 at his home on Money Island, near Toms River, N. J.

—o—

Frank T. Taaffe, 54, vice president, Troy Chain Co., Troy, N. Y., died July 7.

—o—

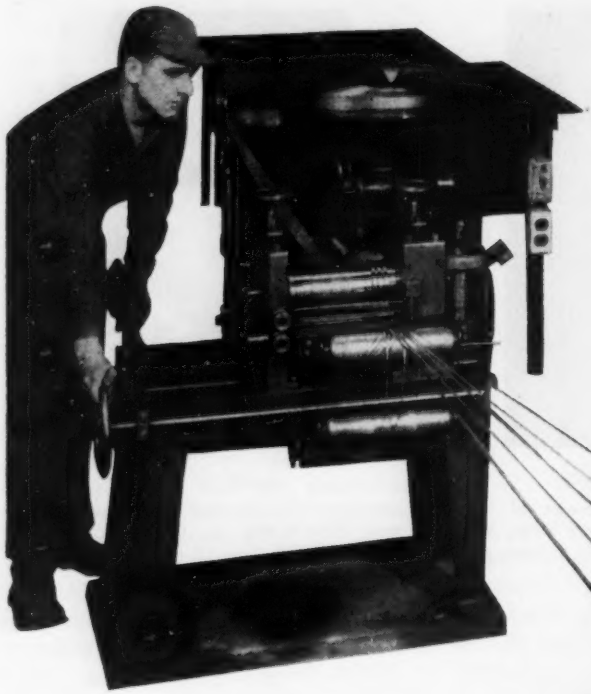
Edwin C. Shultz, 51, who joined the Pratt & Whitney Co., now a division of Niles-Bement-Pond Co., West Hartford, Conn., 27 years ago, and associated with the advertising department, died July 5 after a brief illness.

—o—

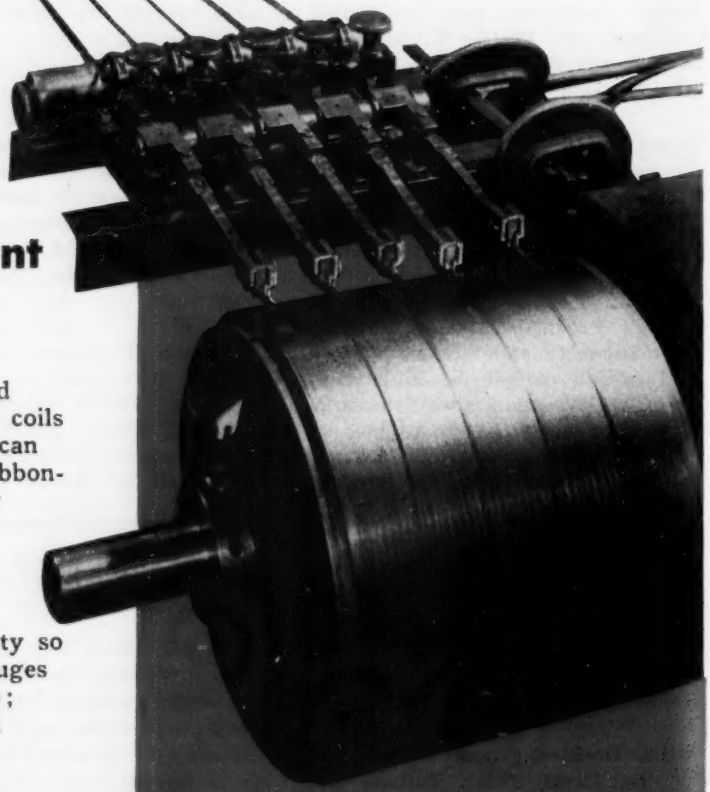
Harold C. Bullard, 69, plant engineer, Bullard Co., Bridgeport, Conn., died June 28 of a heart attack.

—o—

George H. Houston, 66, industrial consultant and president, Baldwin Locomotive Works, New York, from 1929 to 1938, was killed recently in an automobile accident in Mexico, where he had lived since 1946.



HOW TO PUT MORE STEEL ON YOUR REEL



more convenience plus less "downtime" of equipment

One way CMP Thinsteel can help you keep automatic reel-fed equipment at maximum production is by specifying fractional inch widths in oscillated wound coils. By using the longer and heavier coils possible with this method of winding, you can eliminate the problems that conventional ribbon-wound coils present—materially cut costly "downtime" and do away with the hazardous coil handling condition caused by extremely narrow widths.

Thinsteel can provide other cost reducing advantages, too—the usual precision quality so well known; extremely close tolerances; gauges thin as .001" in low carbon (zinc-coat, too); spring steel, alloy and stainless grades; and CMP's helpful assistance in problems concerning your strip steel requirements. Your inquiry will be given interested and immediate attention.

Photo shows Thinsteel being slit and oscillated wound into coils. This method of winding fractional inch widths permits coils to be supplied in extra long lengths.

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CMP STRIP STEEL
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Engineering News . . . AT A GLANCE

MAGNETIC-FLUID MOLDING—Further studies of properties of iron-oil mixtures at National Bureau of Standards, Washington, reveal that magnetic fluids can be employed to good advantage in hydraulic systems, shock absorbers, dash pots and to form casting molds. In molding operations, for example, the fluid is placed in a pot surrounded by a current-carrying coil, and a model of the part to be cast is placed in the fluid. Coil then is energized so that fluid solidifies around the model. When model is removed, a detailed impression remains outlined in the solidified magnetic fluid. Molding compound then may be poured into the mold and allowed to harden. After coil current is turned off the molded replica can be removed easily from the liquid.

SHORTCUTS WELDING TIME—Job of rebuilding a set of mine locomotive wheels, which formerly required the services of two operators for an entire day, was recently reduced to a one-operator chore by an automatic setup involving equipment supplied by Linde Air Products Co., New York. Installation enables a worker to rebuild 5 to 8 wheels per day, depending on amount of wear. Large size coils of welding rod are used in the operation besides welding material fed from a hopper. The wheels are mounted in a lathe and rotated under the welding head at proper speed. An average of 25 pounds of welding material is deposited over the 3-inch face of each wheel in a layer ½-inch thick during the procedure. Welding time is cut from an average of 3 hours by hand build-up methods to 70 minutes.

ROBOT SUPERVISION—Operation of millions of dollars of equipment covering nearly an acre of land is controlled from a single control room by one individual at Shell Oil Co.'s new combination lube plant at Houston. Robot supervision of both sections of the installation designed and built by M. W. Kellogg Co., Jersey City, N. J., is facilitated by instruments that enable one man to be in a hundred different places at one time and to make a tour of inspection without leaving the room. A single instrument, for example, actually makes 72 different temperature measurements at strategic locations. By pressing one of 72 labelled buttons, the operator closes an electrical circuit to a thermocouple at the temperature site. Current generated at junction of the dissimilar wires making thermocouple is proportional to temperature to which it is exposed. This current is flashed back to the instrument at 186,000 miles per second to give the temperature reading.

INSPECTION WRINKLE—By combining the use of fluorescent lights, a mirror and a surveyor's telescope, technicians in General Electric's Schenectady Works Laboratory are able to detect flaws as little as 1/500 of an inch wide on the inside surfaces of holes bored in long metal forgings. When using the technique, according to GE engineers, the forging is first magnetized, then iron oxide particles are blown down the hole. These align themselves with north and south magnetic poles of any cracks present. Next a small cylinder on which three fluorescent tubes and a small mirror are mounted is drawn slowly through the hole. As the cylinder moves through the bore, surfaces reflected in the mirror are examined through the telescope. The iron oxide particles outlining the flaws make them easily visible.

COST CUTTING TIP—Advantages of high-frequency induction heating for joining parts with silver brazing alloy include speed with which joining temperatures can be obtained, uniformity of heat generation once a time cycle is established, and economy in heating costs by being able to localize heat to only areas requiring joining. If wisely exploited, the method, it is pointed out, can be used quite effectively as a means of reducing manufacturing costs—not only from the production standpoint but also through choice of materials. (p. 82)

PASSES "THE WORD"—Operating efficiency of several steel plants has been greatly improved lately by means of a system that "gets the word" to the right place at the right time. The "radio" telephone system which provides two-way conversation between fixed stations and operators of moving equipment, or between operators of two or more units in motion, is said to speed up movements of materials and accelerate processing decisions without any of the delays commonly experienced with regular telephones. (p. 86)

PRODUCTION BUFFING—Special buffing unit designed by W. B. Knight, president, Knight Plating Co., Detroit, is reported to be capable of processing sheet metal screws with No. 6 heads at the rate of 73,000 per hour. According to the inventor, the machine will do in 1 hour what rack buffing would require seven men working a full day. Besides providing nearly perfect machine-buffed screw heads, the unit eliminates entirely the human factor. Its relatively simple design also is reported to hold possibilities for handling larger uniform parts. (p. 89)

STEEL COATINGS—Coatings of equal thickness, deposited by either the hot-dip or electrolytic process, possess about the same resistance to corrosion, according to Charles L. McGranahan, assistant general superintendent of J & L's Pittsburgh Works. He points out, however, that electroplated coatings are especially suited for jobs requiring severe forming or bending as adherence of the coating is of very high order, the coating being practically pure zinc. (p. 91)

By FRANK W. CURTIS

Induction Brazing

With Silver Alloys

. . . offers many advantages and economies in fabricating metal assemblies

Speed with which joining temperatures can be obtained, uniformity of heat generation and economy in heating costs are some of the benefits accruing from use of high frequency induction heating methods

HIGH-FREQUENCY induction heating for joining parts with silver brazing alloys is carried out by heating the area of the parts to be joined and distributing a molten nonferrous filler alloy to bond the contacting surfaces. The advantages of the process include speed with which joining temperatures can be obtained, uniformity of heat generation once a time cycle has been established, and economy in heating costs by being able to localize heat to only the areas requiring joining.

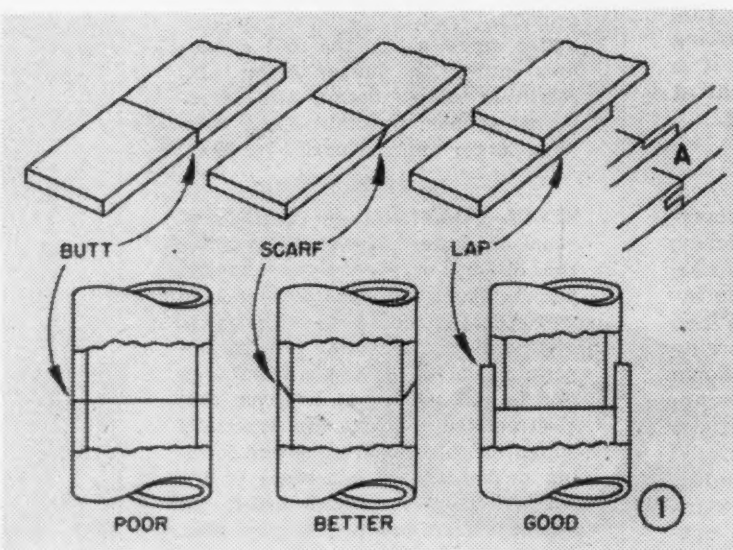
Basically there are three types of joints, namely, butt, scarf and lap, the latter referred to normally as a shear joint. These three joints are shown in Fig. 1, and are used for joining flat or tubular assemblies. The butt joint is relatively weak and should be avoided, when possible, because of the difficulty in providing flat surfaces.

Strength of a butt joint is poor because the area of the joined sufaces is limited to the thickness of the material. Butt joints also are more difficult to align and locate for brazing. The scarf joint, which offers a greater area of contact, is somewhat better because of the added strength it provides. By far, the lap or shear joint is superior for metal joining because of the increased surfaces in contact, and usually because of the ease with which parts can be assembled. For flat assemblies lap and tongue joints shown at A, are preferred because of the mechanical strength gained.

Silver Alloys—Silver alloys for brazing are made in different compositions, with silver varying from 10 to 80 per cent, and with melting points from 1175 to 1600° F. Alloys melting below 1400° F are most commonly used in order to avoid the need for controlled atmosphere, as would be required for temperatures at which scaling takes place. A typical alloy is one having 45 to 50 per cent silver and containing copper and cadmium, which flows freely at 1200° F. Such an alloy will cover the average brazing need and will diffuse sufficiently into metal surfaces to offer exceptionally strong bonds.

As a rule, very little cleaning is required after brazing so that subsequent machining operations are not required. Properly brazed joints are liquid and gas tight, and will withstand shock and vibration. They are not affected by normal temperature changes, they have good electrical conductivity and can be plated by conventional methods.

In Fig. 2 is shown the relative strength of silver brazed joints in relation to joint thicknesses. There is a definite relation between strength of a joint and thickness of the alloying agent. Usually the closer the fit between the surfaces to be joined, the higher the tensile strength of the joint.



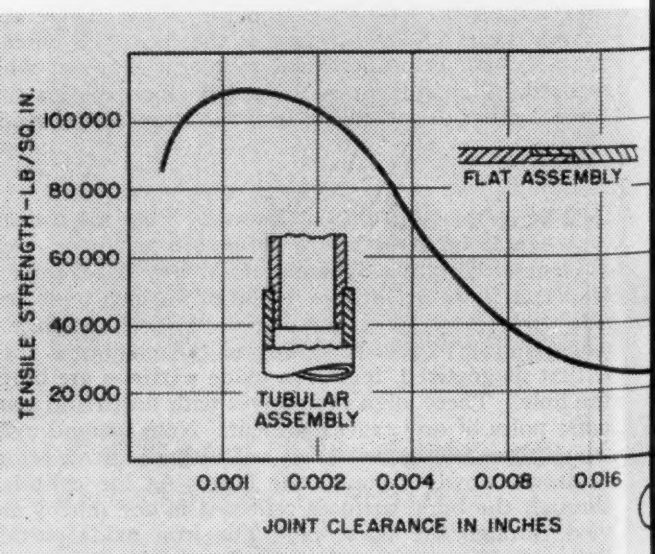
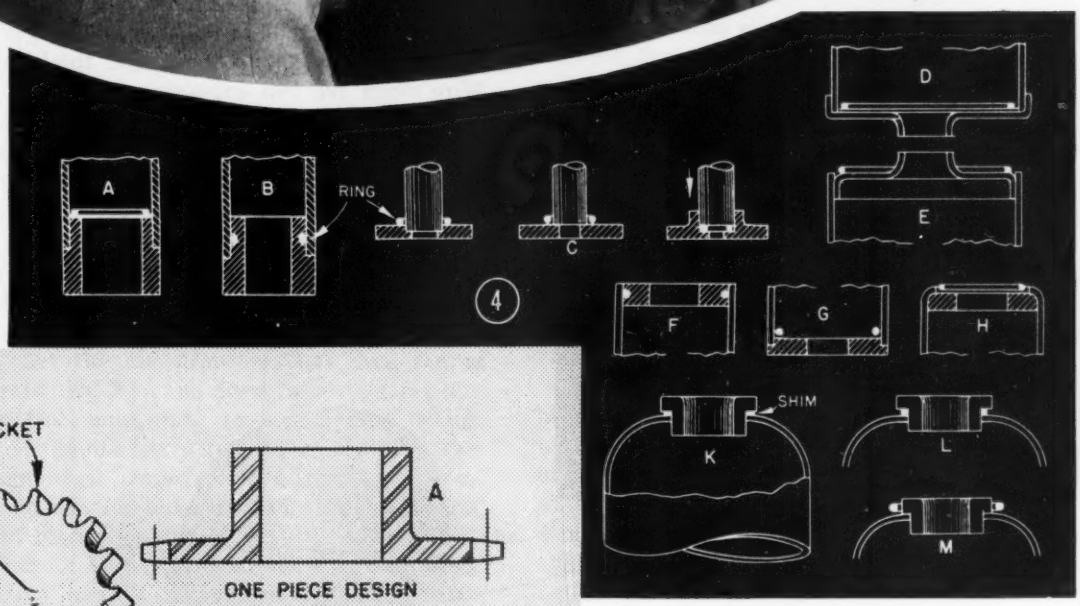


Fig. 5—Production layout for assembling, fluxing and brazing



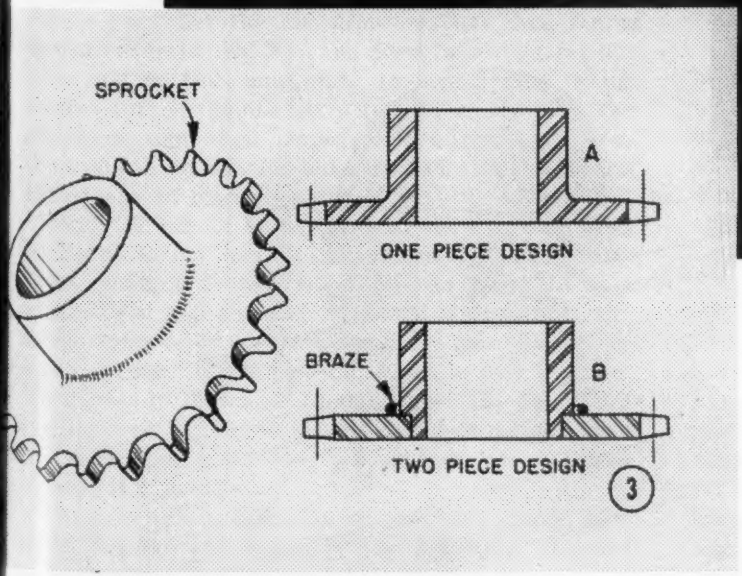


Fig. 1—Three types of joints commonly used for brazing

Fig. 2—Chart showing strength of joint in relation to clearance

Fig. 3—Example of a brazed assembly formerly made in one piece

Fig. 4—Various types of joints suited to induction brazing

Silver alloys make it possible to obtain strengths up to 100,000 psi when the fit or clearance between surfaces is held to 0.001 to 0.003-inch. The strength drops off as the thickness of joint increases to a point where it equals the tensile of the alloy. Thin films of silver alloy offer much more ductility than heavier sections, and are stronger and more economical.

Clearance Allowances — Clearance allowances in shear joints are usually made from 0.0005 to 0.003-inch on a side, depending upon size of the assembly and depth of the joint. Usually, an overall clearance of from 0.001 to 0.002-inch is allowed for small diameters, and 0.002 to 0.006-inch for larger assemblies. Press fits, where a definite interference exists, are not generally practical. Clearances below 0.001-inch often result in bare spots, inasmuch as the silver alloy has no gap in which to flow and, as shown on the curve, the strength of the joint falls off sharply at this point. On the other hand, with excessive clearances between the parts to be joined, the strength of the joint becomes weaker. With proper fit, however, the joint can be made as strong as, or stronger than the material being brazed.

Figures represented in this chart are for tubular sections having uniform circumferential spacings, as well as for flat parts, where parallel surfaces are maintained. Usually flat-surface brazing requires a slight amount of pressure to the joint as it heats, in order to force out excess alloy and thus assure a thin film, which offers the strongest joint.

Reducing Costs — Induction brazing can be considered as a means of reducing the manufacturing cost of a part by joining together two or more relatively simple pieces. This consideration is becoming more evident as a result of the worthwhile economies being effected in plants where induction heating equipment has been in use for a period of time. Usually the techniques of silver brazing become well known and the search for added economies then is a matter of normal procedure. Sprocket shown at the left, Fig. 3, for example, when made of one piece as at A, required more machining than the fabricated design B, which comprises a hub and sprocket blank, brazed together. Such a design can even be made of different materials. The hub could be bronze and the sprocket steel, or, it would be possible to make the sprocket of one grade of steel, such as a medium carbon type, enabling the teeth to be induction hardened after brazing, and to make the hub from steel tubing, or an easy machining screw stock.

In certain cases, inserts can be brazed to heat treated parts without affecting the hardness, while opposite to this it is often possible to harden a localized area after joining without affecting the braze. Another consideration is that brazed assemblies can be taken apart easily or disassembled by reheating, and the parts can then be rebrazed, such as might be required for salvage purposes.

Silver alloy can be applied in the form of wire, thin shims, sheet strip, paste or powder. The most common of these is wire which can be preformed into a ring and placed into the assembly. The wire ring method is preferred because a uniform distribution of alloys is assured. Wire rings and inserts can be formed to various shapes by coiling the wire on a revolving mandrel and then cutting through the turns lengthwise. Thin sheets, or shim alloy can be blanked into washers or inserts, as may be required, and inserted between the parts to be brazed. Wire sizes mostly used run from 1/32 to 3/32-inch or larger, and shims are made of 0.002 to 0.005-inch thick ribbon stock. Wire rings are less expensive than shim inserts and should be used wherever possible. Paste or powdered silver brazing alloy is used by merely applying a small amount in the joint or on (*Please turn to Page* 124)

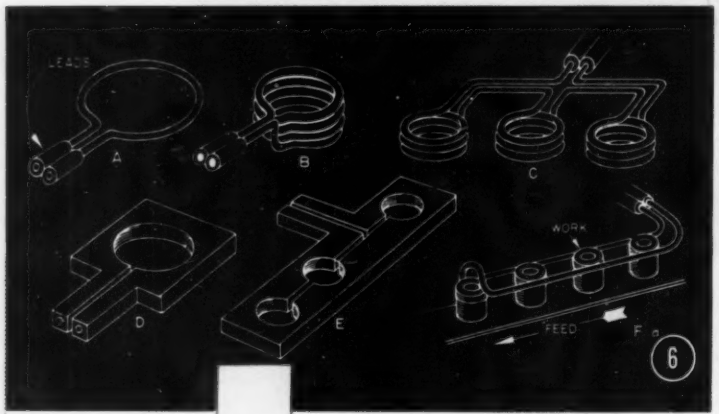
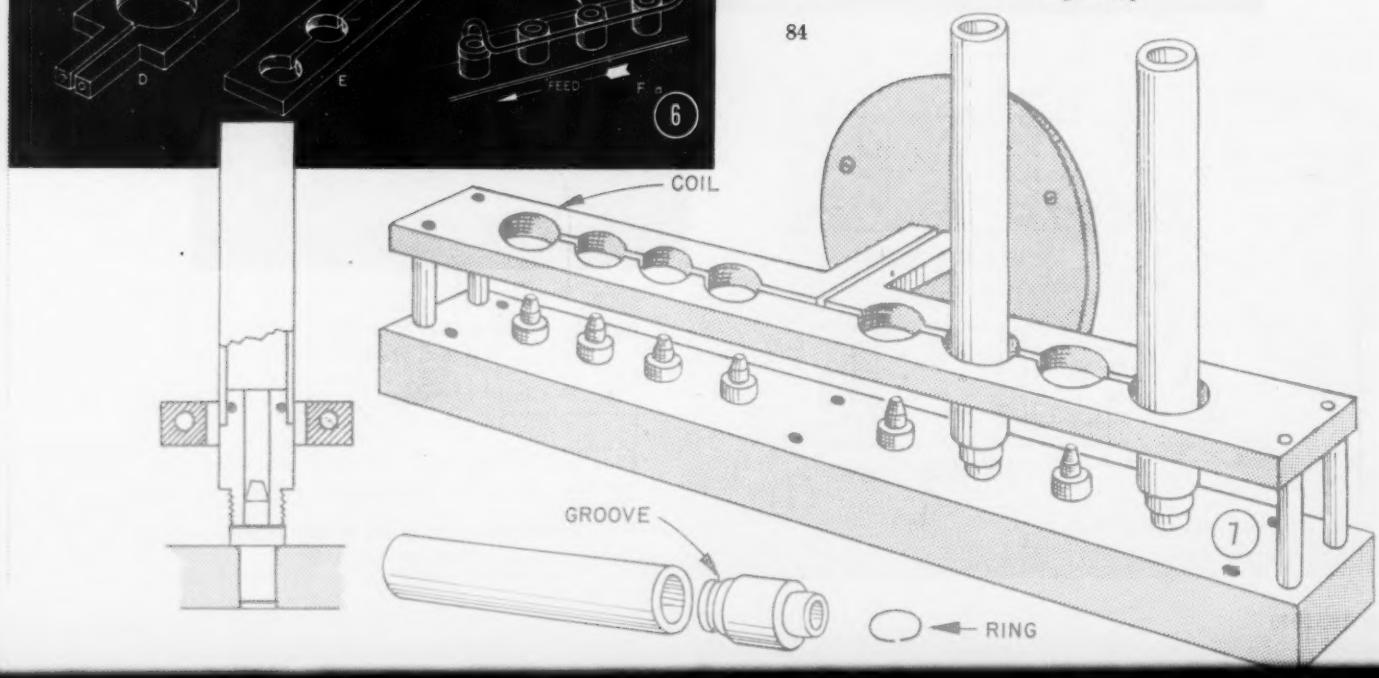


Fig. 6—Different work coils used with induction brazing

Fig. 7—A typical multiple-position induction brazing setup



SEEN AND HEARD IN THE Machinery Field

By GUY HUBBARD
Machine Tool Editor

HOW JOBS ARE MADE: In the July 4, 1949, issue of STEEL, I mentioned a case where a group of workmen with $6000 worth of second-hand machinery started a machine tool company which eventually gave employment to several hundred men and was sold for $3,575,000.

Now in a bulletin issued by Philip M. McKenna of Latrobe, Pa., vigorous advocate of private enterprise and of sound money, I find another striking reference to a similar achievement.

When Henry Bessemer, in 1856, became convinced that it was practical to make steel by blowing air through molten pig iron, he already had earned and saved considerable money as the result of earlier inventions. Mr. McKenna quotes as follows from Bessemer's autobiography:

"After full and deliberate consideration of the whole case, I resolved to continue my researches until I had made my process a commercial as well as a scientific success. At the same time there were duties owed to myself and to my family.

"Having thought over thoroughly the risks and powerful opposition I had to fight, I came to the conclusion that it was my duty to settle the sum of $50,000 on my wife—under trustees—so that I could not be ruined absolutely in the further pursuit of my invention or by litigation in defense of my patent rights. After this investment I still had $60,000 to spend in perfecting my process."

Mr. McKenna points out that within five years more than 1000 men were employed making Bessemer steel and in constructing new furnaces and Bessemer converters. Within 12 years more than 20,000 persons in various companies in England had jobs that had not existed before and steel had become plentiful enough to replace wrought iron and wood in railway and other construction.

Mr. McKenna draws this conclusion: "Suppose that Bessemer and his associates—at the start—had not had $60,000. Suppose too that it had been in irredeemable paper money deteriorating so that in 1856 it had only one-third the buying power that it had when Bessemer laid it away ten years before. In that case the inventor could not have launched his enterprise by building his commercial plant. I can assure you that the big firms at that time represented in the British Iron and Steel Institute were not favorable to this innovation in steelmaking which rendered their plants obsolete. It is only by the power of some real money that an inventor with courage can create new industry and make more and better jobs for more people."

Now let me in turn say something about what Philip McKenna himself accomplished along similar lines. Risking $71,500 which he had saved up as a metallurgist and chemist, he rented a storage garage in his town of 10,000 and began the manufacture of a new carbide cutting material which he had invented. He started in 1938 with 12 employees. By 1940 sales had reached $5,000,000 per year, cost of carbide tools had been greatly reduced, and 300 new jobs had been created in Latrobe.

Through the combination of ingenuity, thrift, personal courage and *sound money*, industrial miracles have been accomplished. It certainly is to be hoped that the days of such industrial miracles here in America are not over—as they seem to be in Great Britain and in other parts of the world.

ED SHULTZ—A TRIBUTE: At this time I have just returned to Cleveland after attending the funeral in Hartford, Conn., of one of the true geniuses in the field of machine tool advertising. For nearly 27 years, Edwin C. Shultz—who died of a heart ailment on July 5, 1949 at the all too early age of 51—had been interpreting through words and illustrations the achievements in machine tools, gages and other products of precision of Pratt & Whitney, Division Niles-Bement-Pond Co., West Hartford, Conn.

While I say "interpreting", I mean it in the best sense of that term. Upon solid educational foundations laid at Massachusetts Institute of Technology, in the 56th Engineers during World War I and at Stevens Institute of Technology, Ed Shultz built a professional career dedicated to transferring to the minds of others his own understanding of—and enthusiasm for—the products of the famous organization for which he worked.

To accomplish this, he first had to convince the management of his company that only through the use of good paper, good artwork, good cuts and good layout—as well as good copy—could the excellence of machines and tools of precision be transferred to and transmitted through the printed page.

All this required expenditure of very considerable amounts of money. Back in those days machine tool builders generally were not spending large sums of money for sales promotion other than that of personal, direct contact character. However, Ed Shultz, a big man of striking appearance, with inborn selling ability and with the courage of his convictions, succeeded in "selling his ideas" to what in those days was a rather conservative management. When Clayton R. Burt became a top executive of the company about 25 years ago, Ed Shultz won his enthusiastic support.

The fine things which grew out of his efforts long have been obvious to all who read engineering and business journals, who study machine and tool catalogs and who attend machine tool shows. Where Ed Shultz pioneered, many others since have followed. The machine tool and gage industries as a whole owe him a debt of gratitude.

STEEL PLANT

Operating Efficiency Improved

By "Wireless" Telephones

Soaking pit and electric furnace cranes, ore bridges, unloaders and transfer cars, coke oven pushers and hot cars are some of the locations benefiting from use of two-way voice communication devices which are energized by trolley wires or plant power lines

By E. F. ROSS
Chicago Engineering Editor, STEEL

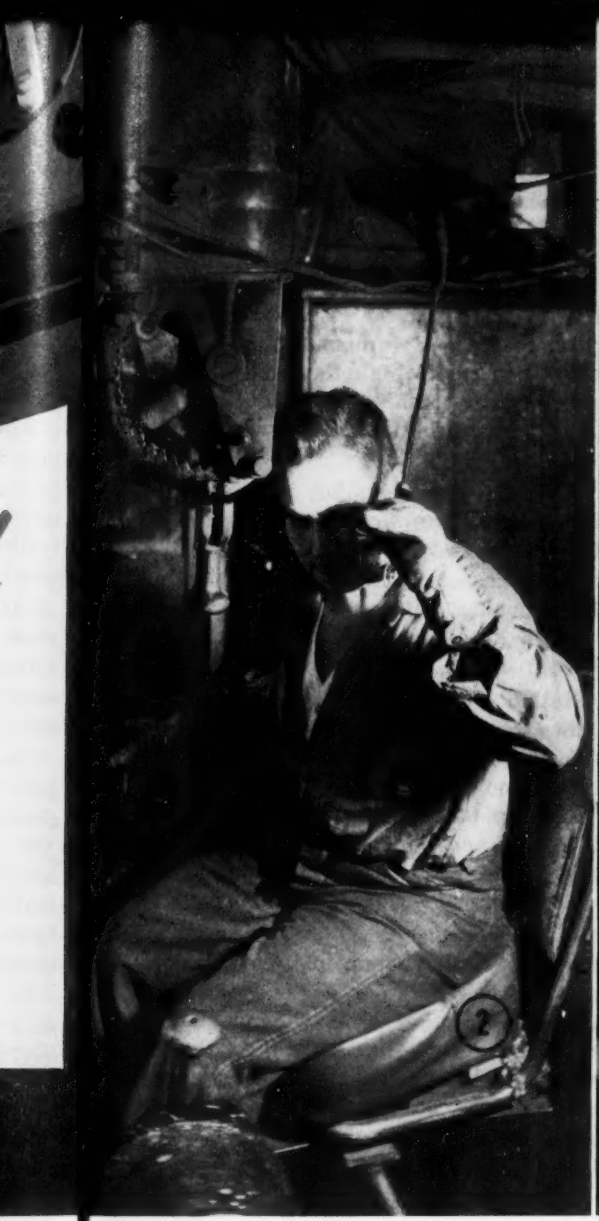
A NUMBER of steel plants are improving operating efficiency and safety through installation of a communication system which provides two-way conversation between fixed stations and operators of moving equipment, or between operators of two or more units of moving machinery, without the conventional wiring of a permanent telephone system but with all of the advantages of the latter. These "wireless" telephones function through use of frequency modulated carrier current and derive their energy from trolley wires or plant power line.

Frequently referred to as the "radio," this communication system is the Femco Trolleyphone, manufactured by Farmers Engineering & Mfg. Co., Pittsburgh. Prior to introduction into steel plants, it was finding wide use in coal mines to provide communication between a central point, such as a dispatcher's office, and mine locomotives. Unlike telephones which are installed at fixed points, the system when installed in mines provides instant and continuous contact not only between equipped locomotives and the dispatcher, but between locomotives whether standing or moving.

More than a dozen steel plants in the United States are making use of one or more installations of trolleyphones, and five of these plants are in the Chicago district. Applications are on soaking pit cranes; electric furnace cranes; ore bridges, unloaders and transfer cars; coke oven pushers and hot cars.

Soaking Pit Cranes—Two trolleyphone installations are in use in Wisconsin Steel Works of International Harvester Co., South Chicago, Ill., one on soaking pit cranes and the other on ore bridges and transfer cars. The control pulpit for the blooming mill ingot buggy is so located that the operator can observe better than anyone else whether ingots are being delivered to the bloomer at the proper rate. He can talk directly with the soaking pit craneman and with the steel recorder. When alloy steel is being rolled, it is up to him to warn the cranemen when to slow down withdrawing steel from the soaking pits in case the ingots are lying on the mill roll table too long and grow cool.

The operator's particular location in this plant makes him a most efficient coupling link between the steel recorder's office, the soaking pit cranemen



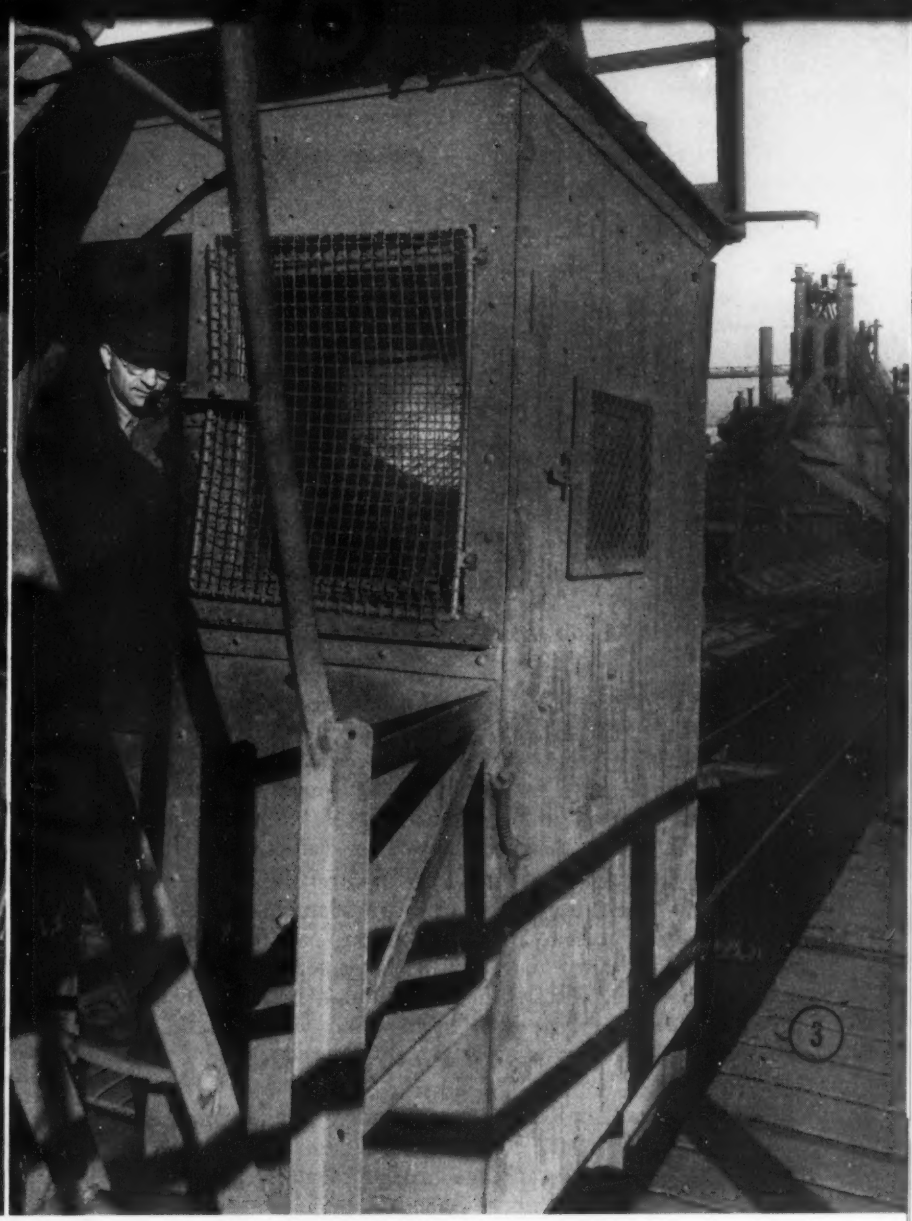


Fig. 1—Inside the cab of one of three electric furnace cranes. Speaker is mounted overhead and has a knob to control volume

Fig. 2—Operator of this soaking pit crane is receiving instructions from the steel recorder's office

Fig. 3—Installation of phones in transfer cars and ore bridges eliminates signalling and shouting of orders

and the blooming mill. In addition to this, if the mill foreman is not around, this ingot buggy pulpit operator can direct the operations of the cranemen when they are rebuilding a pit cover or moving any other piece of equipment from one location to another.

Each of the two soaking pit cranes, is equipped with a trolleyphone so that the operator can communicate with the other crane, the steel recorder, the ingot buggy control pulpit and the two floor stations. The crane operator calls the steel recorder as follows: "Joe, what steel do you want when I finish with pit No. 6?" Joe answers him, no time is lost and the possibility of a misunderstanding of signals is eliminated. At the same time, the other craneman hears the conversation and knows where to expect the first crane to move, thus lessening the danger of a mixup between the two cranes.

Fewer Delays—Bottom makers always have found it difficult to get a crane when they need it to pick up a bucket of coke for dumping into the pit upon which they are working. Two floor trolleyphone extensions connected through the steel recorder's office phone are provided and these are located on the floor where the bottom makers can use them. To get a crane now, all that is required is to call for one by means of an extension. The crane operator will report immediately whether he can or cannot oblige. The steel recorder or mill foreman can cut into the conversation at any time and give instructions.

If for any reason it is necessary to stop withdrawing ingots from the soaking pits, this information can be given immediately to the cranemen from any of several points. At the same time, if a craneman feels that he needs a motor inspector, he can call for one without stopping work, reporting the details of his trouble so that the inspector can get aboard the crane prepared to handle the trouble.

From the Wisconsin Steel Works dock office it

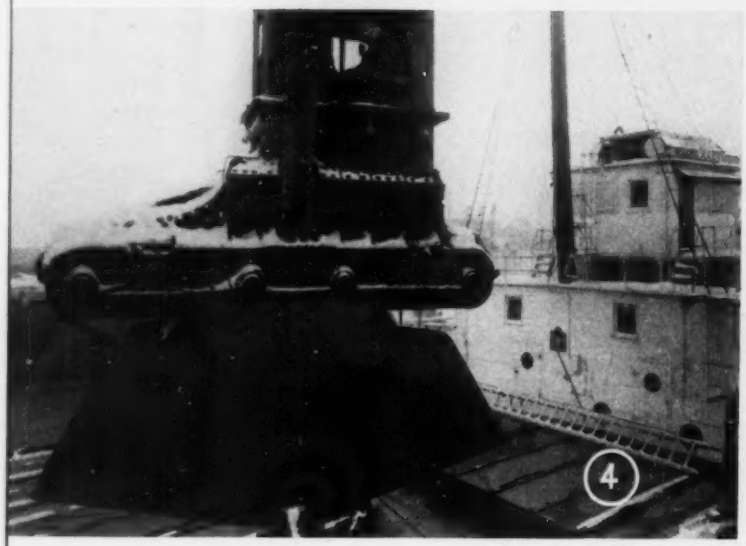


Fig. 4—Here the operator in the leg of the ore unloader is using his microphone. Set used in the leg is connected to the trolleyphone in the main control of the unloader by extension wiring

is possible to talk with the ore bridge and with the transfer cars. The trolleyphone is mounted in a special aluminum portable case by a company technician, the purpose being to enable the dock foreman to take the set to the ore unloaders and to use it at that point to talk to the bridges whenever desired.

Orders from the dock office to the ore bridges relate to the manner in which the ore should be handled, such as transferring ore to the east end or west end. In this connection, it is important, particularly in the winter time, to be able to tell the bridges when they are getting too many lumps and that they should move over to a different section of the ore pile.

Maintenance Improved—Furthermore, for anyone who has climbed into an ore bridge cab, it is easy to understand how much time and effort can be saved by use of trolleyphones when a motor inspector is needed on the bridge to repair trouble. The dock foreman can converse directly with the bridge operator and find out what is wrong before the inspector is sent aboard to remedy the trouble.

Transfer car operators are constantly in touch with the bridge operators to tell them what type of ore is needed. Before trolleyphones were installed, it was necessary for transfer car operators to go outside and signal for the bridge operator to come closer and step outside of his cab. Then the two operators would converse by shouting through cupped hands. This procedure, always unsatisfactory, now is eliminated through use of the phones. These transfer car operators are in touch with the dock office just as are the bridge operators.

An ore bridge cab is quite noisy because of electrical contactors opening and closing as the bridge operates. Before the phone system was installed it was extremely difficult to get the operator's attention from any outside point. Through the trolleyphones, the operator is in direct communication with the other bridges, the transfer cars, the dock office, and can be connected with the unloaders.

As a result, the operator now is able to concentrate fully on the work to be done and is not concerned with continually looking about to see if someone is signalling him, nor is he obliged to listen for numerous whistle signals or shouts. He receives his instructions directly from the dock office, from the transfer cars, or from a foreman at the unloaders with maximum efficiency. Furthermore, he is in a position to report any trouble to the dock office immediately and to describe the various details of this trouble.

Inland Steel Co. has installed trolleyphones on soaking pit cranes at its works at Indiana Harbor, Ind. At the steel recorder's office, 36-inch mill, plant No. 1, the equipment is used for communicating directly with the soaking pit cranemen to designate the pits from which hot ingots are to be withdrawn or into which cold ingots are to be charged.

Ground Station — This office is the "ground station" for these cranes and any trouble which the operators encounter or any questions the latter may have regarding movements are directed to the man in this office. He is the one to whom they report in case of trouble and he is the one who tells them when they should assist the bottom makers or move any equipment from one place to another.

At its South Chicago, Ill., plant, Republic Steel Corp. utilizes two trolleyphone installations, one on its soaking pit cranes and the other on its ore bridges and unloaders. In Fig. 4 is shown one of the unloaders with the rider in the leg holding the 'phone microphone in his hand. The trolleyphone itself is located in the main control room of the unloader and the microphone and speaker set in the control pulpit in the leg are connected by means of extension wiring.

The operators of the two unloaders at this dock are in constant communication with each other and with the ore bridge operators. At night and in foggy weather, this contact is especially desirable at this particular dock; it not only prevents accidents but assists with unloading procedure efficiency. It is most advantageous at night for the unloader operator to be able to call the ore bridge operator and tell him, for instance, that the trough is full opposite hatch No. 20 and that he should clear it out while the unloader moves to hatch No. 30.

Electric Furnace Cranes — Northwestern Steel & Wire Co., Sterling, Ill., has installed trolleyphones on its electric furnace cranes. From the ground unit are transferred to crane operators in this building all instructions for pouring, charging and mold handling. Company management asserts that the installation has contributed significantly to efficient operation of the plant and at the same time has provided a greater degree of safety to workers.

This ground station is equipped with a large bell-type loud speaker so that calls from cranemen to the ground can be heard in a considerable area in front of the steel control booth.

Fig. 1, a view inside the cab of one of the three electric furnace cranes, shows the loud speaker mounted directly behind (*Please turn to Page* 126)

By A. H. ALLEN
Detroit Editor, STEEL

High Speed Buffing

Special Unit Processes 73,000 Parts Per Hour

DEMANDS for smooth finishes on heads of plated screws, emanating principally from the automotive industry, have made it necessary to buff the heads, either before plating or just after the base copper flash, in order to remove tool marks and irregularities which would show through even the best nickel or nickel and chromium plate. At the same time, users are unwilling to pay the normal costs involved in such buffing operations which have been tedious and time-consuming. Likewise, screw manufacturers sending the product to outside plating shops cannot absorb buffing costs.

The impasse called for development of some means of high-speed automatic buffing, a problem which W. B. Knight, president, Knight Plating Co., Detroit, has been attacking for the past 10 years or more. Working more or less on his own, he built several versions of automatic buffing machines, finally arriving at a unit which seems to have significant possibilities for a wide range of products other than screw heads for which it was designed.

Hopper Feeds Screws—Equipment includes an inclined hopper into which the unbuffed screws are loaded, a means for picking up the screws one at a time and lining them up in vertical file, an inclined slot down which the file of screws travels to the buffing heads, two parallel V-belts traveling in steel guides under the buffing wheels and spaced so that sufficient pressure is developed to hold the screws securely in vertical position as they pass under the wheels and a discharge chute down which the buffed screws slide as the V-belts spread sufficiently to release them.

Fig. 1 shows the hopper with a load of screws in place. It is of steel construction, 15 inches deep and 23½ inches in diameter at the bottom. A circular plate is provided in the bottom, of such a size that an annular slot is left about 2 inches away from the bottom corner.

As the hopper is rotated through a 1 hp motor and belt drive at about 25 rpm in a clockwise direction the screws fall into the slot, heads up. At a point about "one o'clock" a pair of steel fingers, straddling the slot in the hopper bottom and riding thereon pick up the screws and they descend by gravity between two steel bars, shown descending to the right in Fig. 1, so spaced as to hold the screws loosely. Travel is speeded by attaching small air vibrators at the top and bottom of the slide.

Construction of Machine—Buffing machine proper, built up of welded steel angles and flats as shown in Fig. 2, carries two horizontal 3/16-inch shafts at either end, carrying pulleys or sheaves for the chain drive and V-belts. The two end shafts are about 6 feet apart and are powered at the discharge end through a 2 hp motor, speed reducer, chain and sprockets. The pulleys carrying the V-belts are spaced sufficiently apart to permit free passage of the file of screws. As they near the guides they pass over horizontal rollers which pull the belts together just as the screws meet them with the result that the line of screws coming down the charging slide is literally pinched off the slide and carried on under the buffing wheels. The guides or shoes are covered on top with steel plates bolted in position and falling away from the center at an angle of 20 degrees on each side, permitting the buffing wheels to clear them and contact only the passing row of screws.

Five vertical support arms, mounted rigidly in the frame of the machine, and adjustable through turnbuckle-type screws, carry the five buffing wheels.

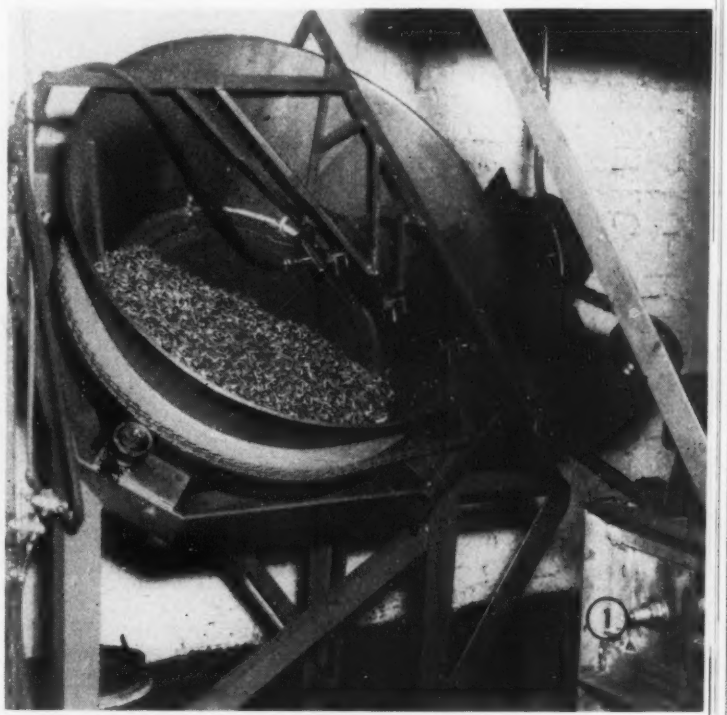
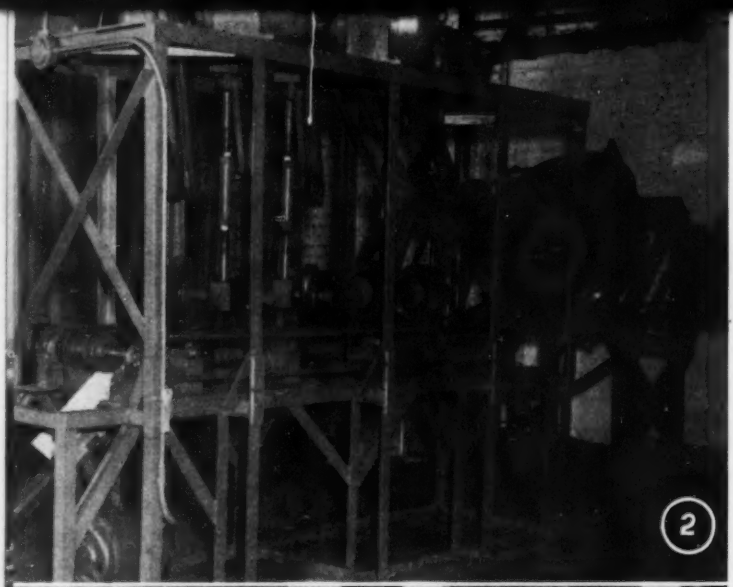


Fig. 1—Hopper and pickup arm of machine for high speed buffing of screw heads. Note slot in base of hopper into which screws fall, to be picked up by curved fork which straddles the slot. Air vibrator is attached to arm to facilitate travel of screws down the slide



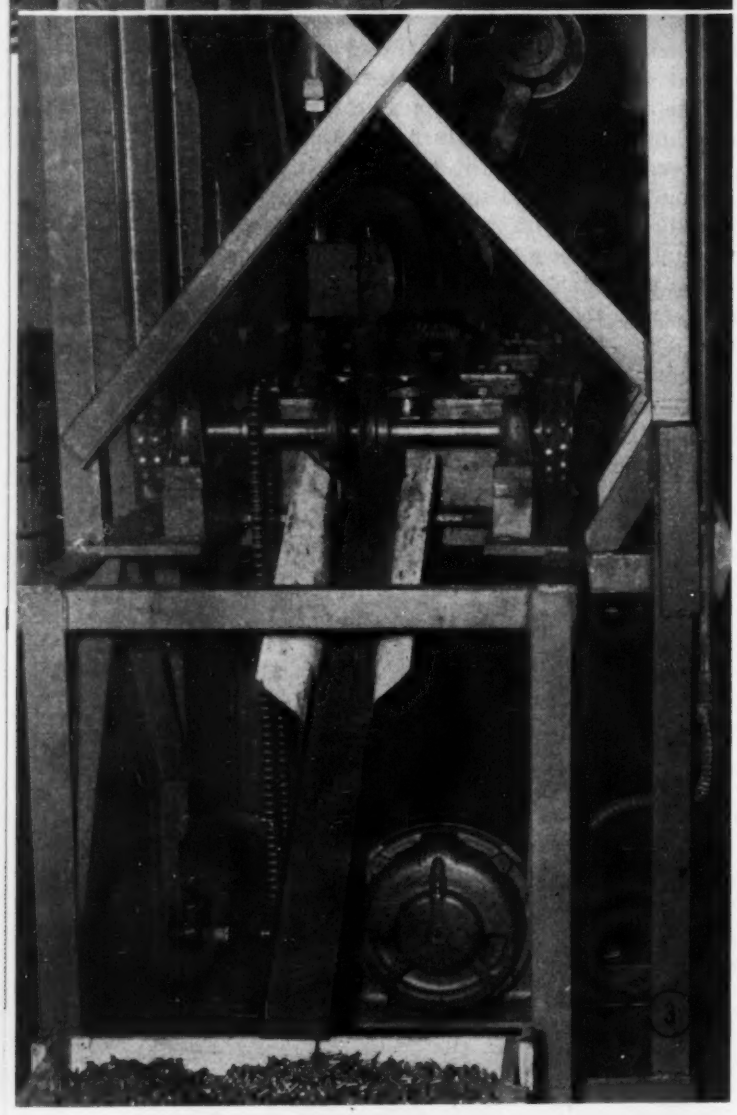


Fig. 2—Overall view of machine, showing the five independently driven buffing wheels, positioned at different angles to cover the entire surface of each head

Fig. 3—Discharge end, showing how V-belts spread after they pass horizontal rollers, permitting screws to drop down chute into case. Below is 2 hp motor and reducer for driving the belts

Atop the frame are five 5 hp motors for driving the buffs through V-belts and intermediate shafts with two sets of pulleys which are of suitable relative diameter to provide the proper speed to the buffing wheel. The buffing wheels, built up of standard buffing disks, are adjustable to any angle horizontally. Pressure may be varied by rotating the central turnbuckle screws in one direction or the other; this permits almost any desired degree of "cutting" on the screw heads.

Wheel shafts may be positioned at any angle for the proper buffing action, and be moved in or out horizontally through lateral support screws. Compound is applied to the buff by hand with conventional sticks, although it may be possible readily to devise a means of piping liquid compound to them automatically. In some cases, it has been found that better results are obtained by using no compound at all on the fifth or final buff.

High Production—Production speeds of the unit are spectacular. For example, ⅞ x 8 sheet metal screws with No. 6 heads have been handled at a rate of 73,000 per hour, with a belt travel of 25 fpm. Larger sizes naturally require a longer time, but it is figured that if 15 seconds time under the five buffing heads is required, production can be held at a minimum of 30,000 per hour. As Mr. Knight tells it, the machine will do in an hour what rack buffing (placing screws in drilled holes in wood racks and holding them against buffing wheels) would require seven men working a full day. Average sizes of sheet metal screws range from 25,000 to 55,000 pieces per case, so it would appear practical to buff a case an hour.

Discharge end of the machine is shown in Fig 3, in which it will be observed there are two leather-link belts at either end of the driveshaft. Function of these belts is to relieve the load on the central V-belts which carry the screws and to divide the power evenly between the two sides.

Much of the success of the machine hinges upon the successful design of the hopper and pickup arrangement. Proper angle of the hopper, width of the slot into which the screws fall (0.190-inch for No. 6 to 10 screws inclusive), angle and curvature of the pickup fingers are three factors which only extensive trail and retrial finally proved out.

Various Screw Sizes—By changing the size of the disk in the bottom of the hopper, a wider or narrower slot can be obtained. Thus, a slightly larger disk narrows the slot to accommodate No. 2 to 5 screws, while a slightly smaller disk would open up the slot to admit No. 12 to perhaps ⅜-inch; a still smaller diameter would take 5/16 on up to ½-inch sizes.

It is planned to install exhaust hoods and ducts over each buffing wheel to carry away buffing compound thrown off the wheels which travel at speeds on the order of 3000 rpm.

Since the human factor is eliminated in the buffing operation, the uniformity of the machine-buffed screw heads is nearly perfect. This, plus the high speeds possible and the relatively simple design of the machine, suggest the unit may have interesting possibilities for future application of the rapid and automatic buffing of small uniform pieces or parts.

FUNDAMENTALS of STEELMAKING

NUMBER 9 OF SERIES

Another in a continuing series of articles on the making of steel and finishing it into products ready for the consumer. Each article is written by an outstanding authority in his particular field.

Production of

HOT and COLD-ROLLED

Strip and Sheets

The author presents in this seventh section a discussion of galvanized sheet and strip, coating methods and equipment utilized, operation of a galvanizing line with a description of a continuous unit

By CHARLES L. McGRANAHAN
Assistant General Superintendent,
Pittsburgh Works
Jones & Laughlin Steel Corp.
Pittsburgh

PART VII

EASE with which steel sheets and strip can be fabricated has resulted in their extensive use in the manufacture of containers and machinery, and in indoor and outdoor applications subject to corrosive atmospheres. The need for protective coatings was recognized at an early date and application of zinc for such a purpose was patented by Crawford in 1839 and subsequently followed by patents of Moorewood and Rogers in 1846. The first method was known as the hot-dip process and consisted of three steps: 1—Thoroughly cleaning the steel sheet's surface, 2—passing it through a layer of flux composed of ammonium chloride, and 3—continuing its travel through a molten zinc bath, the travel time being long enough to raise the steel's temperature to that of the bath. When the sheet is withdrawn and cooled, its surface is found to be covered with a coating of zinc, which is in reality two layers thick, the outer layer being of the same composition as the bath of spelter and the inner layer being of an iron-zinc alloy. The iron-zinc alloy forms only at temperatures above the melting point of zinc and is therefore not present on electrolytically coated sheets. The term galvanizing originated from the fact that an iron sheet was being covered with zinc, the iron and zinc constituting what is technically known as a galvanic couple. Base metal that is commonly coated today is the ordinary low-carbon commercial quality or drawing quality steel sheet or strip.

Two most common methods of applying a zinc coating are the hot-dip process and electrolytic process. It was pointed out above that the hot-dip coating consisted of various layers of zinc and iron-zinc alloy whereas an electroplated zinc coating is practically pure zinc, free of any alloyed iron. Coatings of equal thickness, deposited by either method, possess about the same resistance to corrosion. Electroplated coatings are especially suited for jobs requiring severe forming or bending as the adherence of the coating is of a very high order.

The purchaser is usually interested first, in the life of coating, secondly, in the forming characteristics of the sheet or strip and lastly, in surface appearance. The life may briefly be described as the period of time during which the coating prevents a failure of the base metal. This period varies considerably with coating thickness and type of atmosphere to which the sheet or strip is subjected. Table VI shows what might be reasonably expected of various thickness of coatings in different atmospheres.

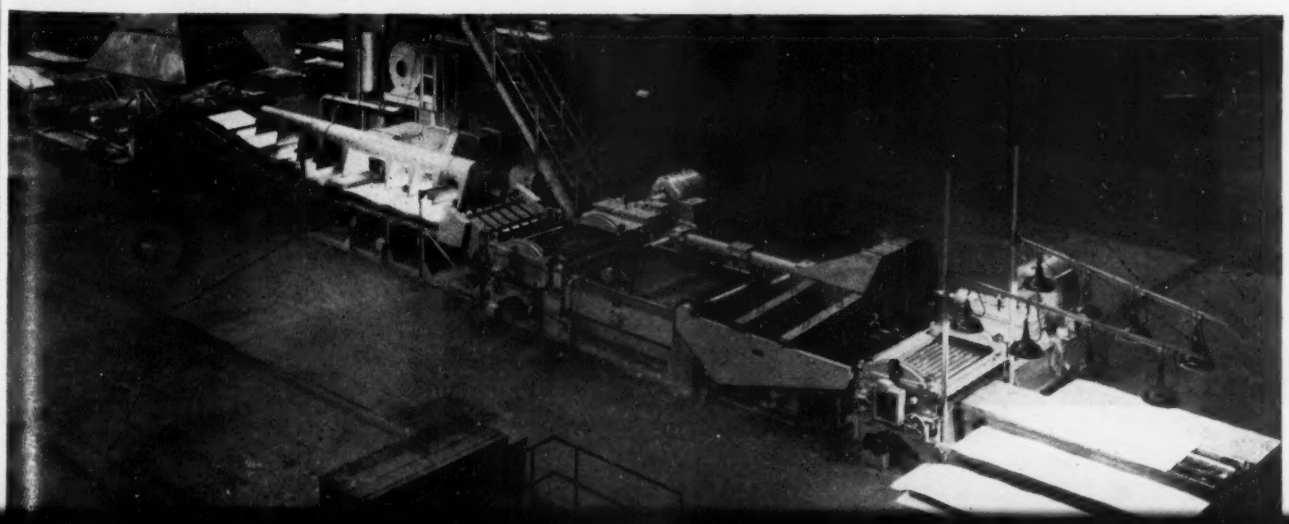


Fig. 59—View of a modern galvanizing line. Aetna Standard Engineering photo

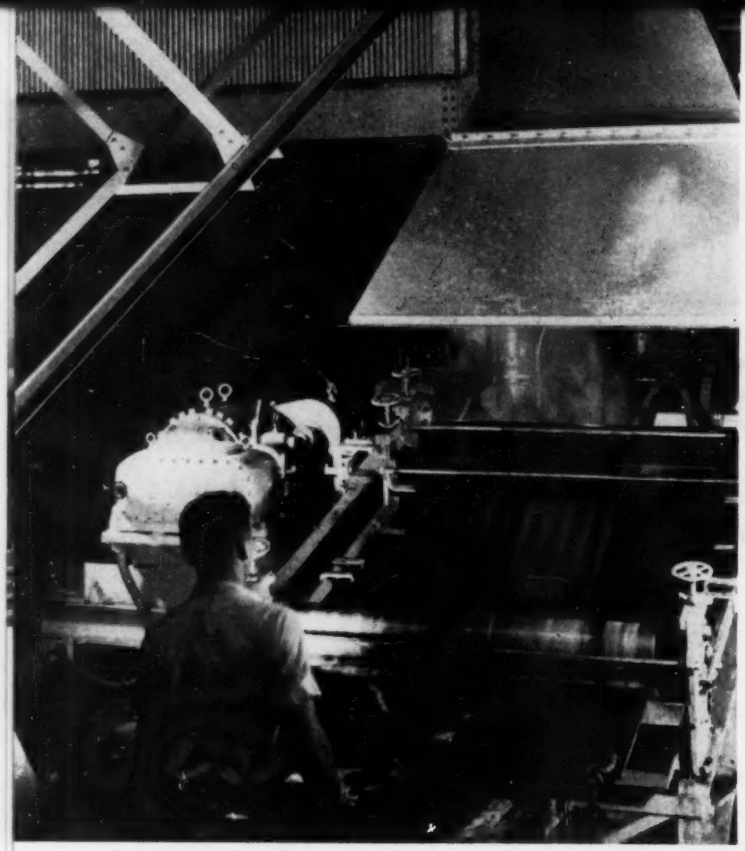


Fig. 60—Feed table and acid dip tank of a modern galvanizing line. Note hood for removal of fumes and a P.I.V. drive to left of dip tank. J&L photo

Corrosion resistance of zinc coatings on interior applications is about the same as would be expected from outdoor applications protected from rains. Some investigators have placed this life at five times that of a coating exposed to the outdoor elements in the same locality.

An inspection of Table VI reveals the importance that coating thickness plays in the life of zinc-coated products. Many applications require only a limited resistance to corrosion and the coating thickness on products such as box strapping, armoured cable, conduit, etc., may be as light as 0.0001 to 0.0005-inch. The usual coating for galvanized sheets for outdoor use is 2 ounces per square foot. This represents the weight of coating for both sides of the sheet and is equivalent to 0.0017-inch thickness per side. Minimum coating that can be used with any success on outdoor applications is 0.001-inch thickness. Its life in some industrial atmospheres may be of short duration. Coatings of 0.0005-inch thickness have given satisfactory life on sheltered outdoor exposures and 0.00015-inch have been equally successful for indoor use.

Galvanized sheets which have been coated with zinc by the dip-method and cooled under proper conditions have a spangled appearance which resembles snowflakes or perhaps more nearly the appearance of a frosted window pane. Addition of tin to the bath improves the sheet brightness and spangle development. Other methods, such as blowing sulphur dioxide or ammonium chloride underneath the sheet as it emerges from the exit-roll of the galvanizing machine, are also used. Controlled spangles such as a checker board design are produced by having the sheet make contact with a pair of rolls whose surfaces are covered with rows of points arranged in a geometrical pattern. Dull surfaces are produced by light coatings and rapid cooling. The spangle, in itself, has no effect on resistance to corrosion. Sheets that have been coated by the electrolytic process have a dull finish.

A modern sheet galvanizing line consists essentially of a feed table, an acid-dip tank, a galvanizing machine and pot, a two-section conveyor, a washer, a dryer, a leveler and a piler, Fig. 60. Some lines are equipped with a leveler located between the conveyor and the washer and a second one after the dryer, it being thought that a better job of cleaning can be done on a flat rather than on a wavy sheet and that the second leveler will remove any distortion caused by immersing the hot sheet in the washing tank.

The feed table consists of a steel or wooden bench of sufficiently rugged construction to sustain a load of a ton or more of pickled sheets but not too heavy to be moved aside when cleaning or drossing the pot at weekends. Steel benches are frequently mounted on a track to increase their mobility.

The acid-dip tank is a shallow container of steel construction, rubber covered or of stainless steel and is equipped with rubber-covered entrance and exit rolls and acid resistant guides. The galvanizing machine or rig consists of two frames or housings of cast steel or of rolled steel-plate construction being held together by cross bars. Mounted in suitable windows in the housings are a pair of feed or flux rolls, one or two pairs of bottom rolls and a pair of grooved exit-rolls. A flux box and necessary guide between each set of rolls are also attached to the housings.

The pot or kettle for a 66-inch double bottom roll-rig would have the following dimensions, width 96 inches, length 136 inches and depth 60 inches. It would be made from low-carbon open-hearth steel plate of firebox quality from 1¼ to 1½ inches in

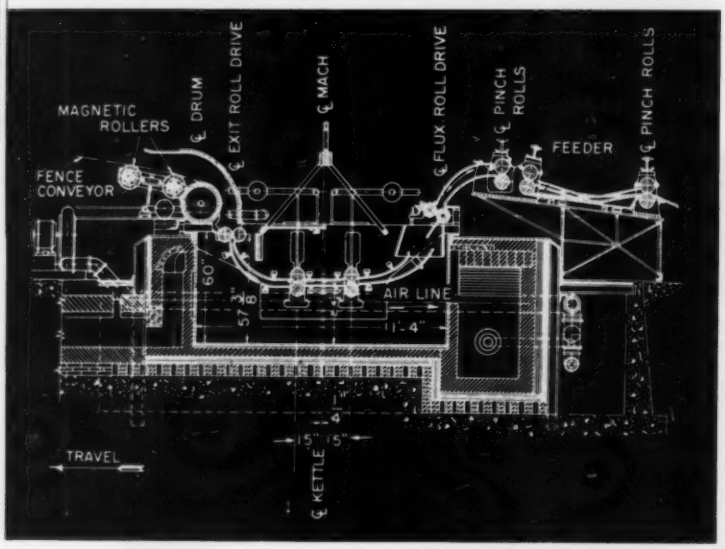
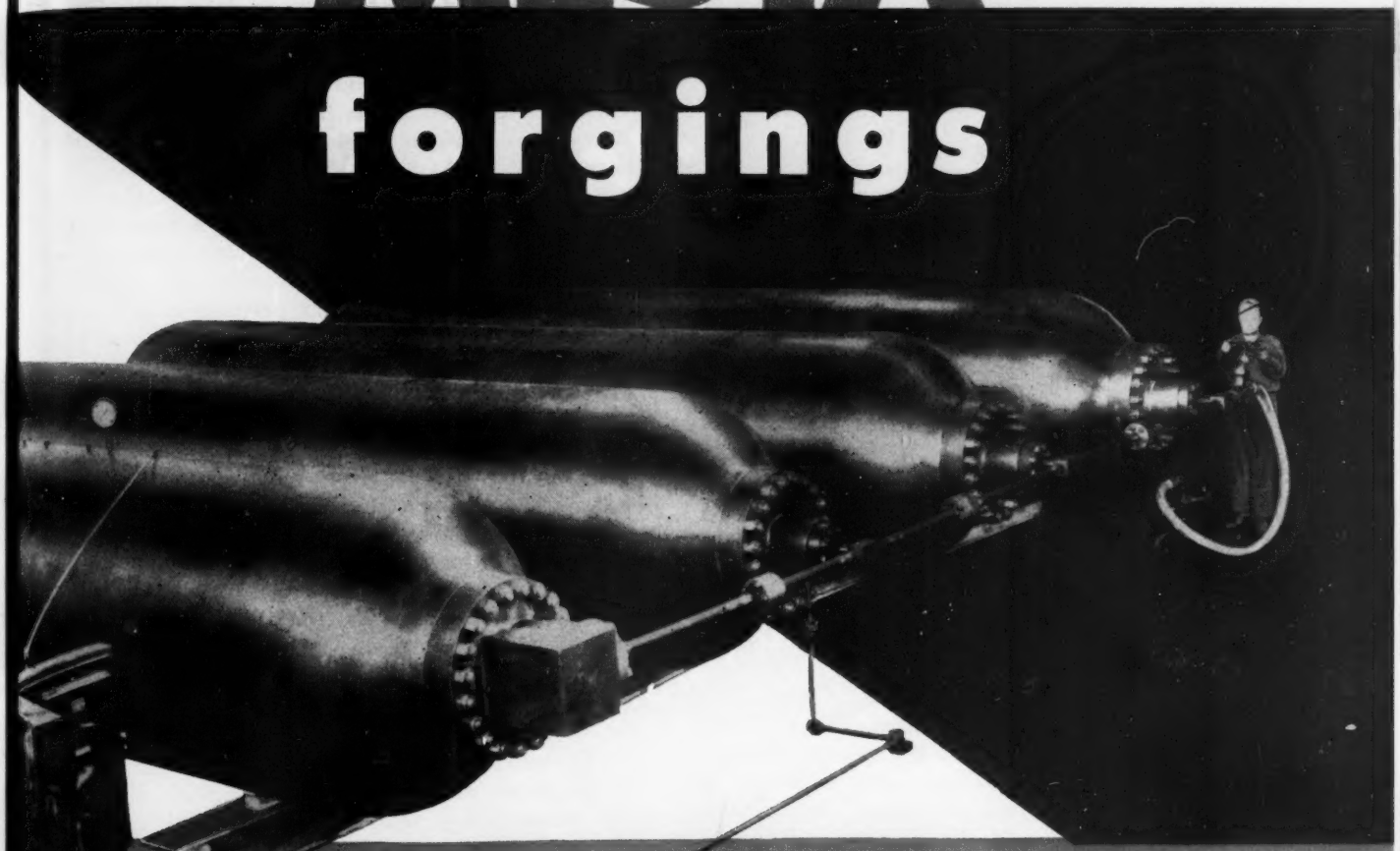


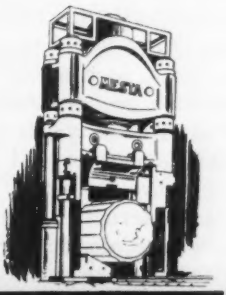
Fig. 61—Cross-section through pot setting showing feeding device, machine and magnetic rollers. Aetna Standard Engineering drawing

MESTA forgings



Mesta Forge Shops have unsurpassed facilities for producing the largest forgings, from raw material to finished product, including crankshafts, marine parts, rotor shafts, rolls and pinions, pressure vessels, pump blocks, table rollers, and many others.

The four large, one-piece, steel pressure vessels shown were forged in the Mesta Shops and are being hydrostatically tested.



DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS

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Fig. 62—Rocker-type machine for pickling sheets for subsequent processing in a galvanizing pot. J&L photo

thickness and of welded construction. The pot is operated at a temperature of 850 degrees F and there occurs a continual formation of what is known as dross metal, due to contact of molten zinc with the sheet or strip being coated, the machine and the pot. This iron-zinc alloy is of a slightly greater density than the bath and settles to the bottom of the pot. Underfiring would agitate this dross formation so the pot is mounted directly upon a fire-brick insulated foundation, Fig. 61, and heat applied at the entry end and along the sides of the pot. Due to the fact that all of the cold uncoated sheets enter at one end of the machine it is practical to have a combustion chamber at this point only and still maintain reasonably close uniform temperatures throughout the bath. Waste gases are conducted along the sides of the pot to a stack which is equipped with a damper. Automatic temperature controls and suitable proportioning valves maintain proper temperature when using liquid or gaseous fuels. Submerged radiant tubes, such as are used for heating tinning pots, may also be used for galvanizing pots.

The first conveyor section is frequently called the spangle conveyor and consists of a large mesh spiral woven wire fence felt, usually of galvanized material. It is constructed quite similarly to the low safety fences used along our main highways. The conveyor is located as close to the exit rolls of the galvanizing machine as possible and is equipped with magnet rolls which hold the coated sheet to the conveyor belt, thereby chilling the still molten spelter and promoting the formation of spangles.

The second section of the conveyor is known as the cooling conveyor and employs a similar belt but of a smaller mesh. This section, as well as a portion of the spangle conveyor, is equipped with air ducts on one or both sides of the belt which permits uniform cooling of the sheet.

The washer consists of a steel tank, equipped with a set of submerged rubber rolls with guides located on either side of them. This unit can be a source of scratches on the sheet coating unless care is exercised in its adjustment and operation.

The leveler used in the line is of the conventional 17-roll type such as used on a cut-up line or skin pass mill.

Before a dip-galvanizing line can be placed in operation it is necessary to dry the pot setting, after which slabs of spelter are placed within the pot and melted. It is customary to put sufficient molten or pig lead on the bottom of the pot to provide a depth of from 2 to 6 inches. Slabs of spelter are next piled above the lead, those slabs adjacent to the sides of the pot being stacked with the flat surface against the steel shell to promote their melting. When pig lead is used several inches of water is placed within the pot and heat applied, the evaporation of the water bringing the lead and zinc up to a temperature of about 200 degrees F and speeding up the melting operation. When the entire bath has become molten, the zinc floats upon the lead which reduces the surface exposure of zinc to iron thereby reducing the amount of dross formed. Any dross, which is formed, settles to the top of the lead bath, where it is more readily skimmed than from the bottom of the pot or kettle.

The melting operation may require as much as 40 hours or more on larger pots. Some zinc oxide and other refuse will be found floating on top of the bath which is skimmed off and the machine carefully lowered into position. Grooved exit rolls are removed previous to lowering the machine, after which they are pickled, placed in their proper location and coated by revolving in the clean zinc bath. Horizontal center line of the exit rolls is set slightly below the bath's surface, after which the flux box is attached to the machine's entry side and flux added. During this period, the acid-dip tank and feeding table are aligned and the unit is ready to operate.

Hot-rolled sheets which may or may not have been annealed, and cold reduced-annealed sheets comprise the usual stock from which galvanized sheets are made. Hot-rolled sheets are usually equivalent to commercial quality for physicals and flatness and may have been skin-rolled in the lighter gages and wider

TABLE VI

ESTIMATED LIFE OF ZINC-COATED PRODUCTS IN THE ATMOSPHERE

Thickness, Thousandths of an inch	Weight in Oz/ft² of Surface*	Life in Years under Atmospheric Conditions					
		Rural	Tropical Marine	Temperate Marine	Suburban	Urban	Highly Industrial
3.6	2.00	50	40	35	30	25	15
2.3	1.25	35	30	25	20	17	9
1.8	1.00	25	20	15	12	10	7
1.1	0.60	10	8	7	5	4	3
0.66	0.37	7	6	5	4	3	2
0.44	0.25	5	4	3	3	2	1

* In the case of galvanized steel sheets the weight of zinc is specified in terms of total zinc on both sides of the sheet: i.e., a 2-oz sheet has 1 oz of zinc per sq ft of surface. Consequently in estimating the life of galvanized sheet in the light of data given in this table, the specified weight and thickness values for the sheet should be halved.

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- ✓ *Can be* BENT . .

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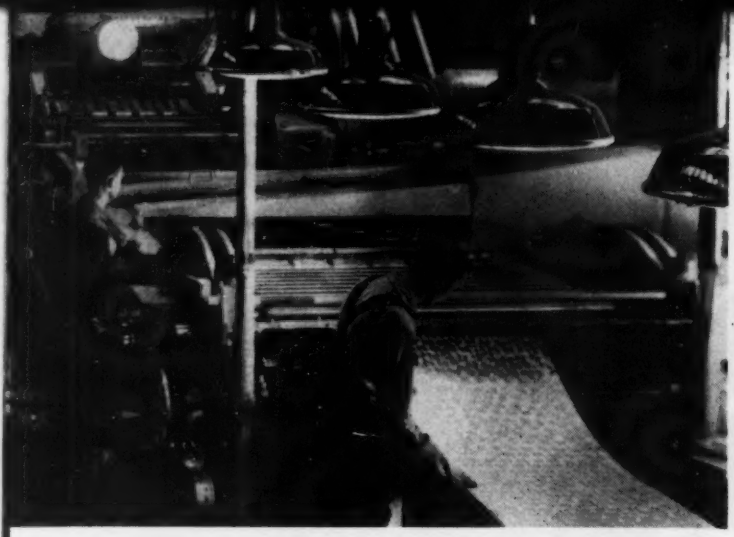


Fig. 63—Delivery end of a galvanizing line showing sheets being inspected and piled previous to delivery to warehouse. J&L photo

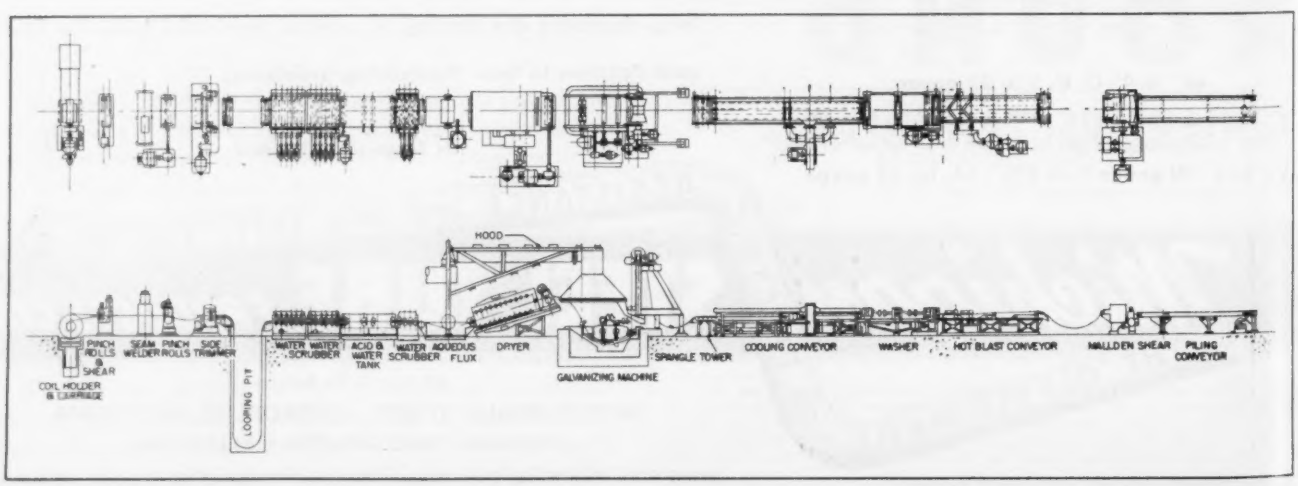
widths. Cold-reduced gages are frequently cleaned on an electrolytic cleaner prior to annealing, duplicating tin plate practices, however, this procedure, while desirable is not necessary for roofing and siding sheets when proper purging is used in annealing. Deoxidation is not necessary in the annealing nor is temper rolling necessary except for applications requiring exceptional flatness; however, temper rolling does improve the forming and matching of V-crimp and channel-drain sheets. When cold-reduced sheets are annealed in coils, skin rolling becomes a necessity in most cases as strip cannot be decoiled without producing excessive crossbreaks. Black sheets, meeting drawing quality specifications, may be used for special applications when so requested. Black sheets for galvanizing are usually pickled on a rocker-type pickler shown in Fig. 62, and are stored in water tanks until ready for galvanizing. Sheets produced on hand mills are pickled previous to black annealing while hot-rolled sheets from the strip mill carry the rolling oxide. Cold-reduced sheets carry a light film of oxide when electrolytically cleaned prior to annealing or a slightly heavier film when not cleaned. If annealing covers are not properly purged the rolling compounds produce a smudge which does not pickle-off too readily. Essential points in this pickling operation are the complete removal of all scale, followed by a thorough washing to eliminate any trace of iron salts. Insufficient pickling produces an in-

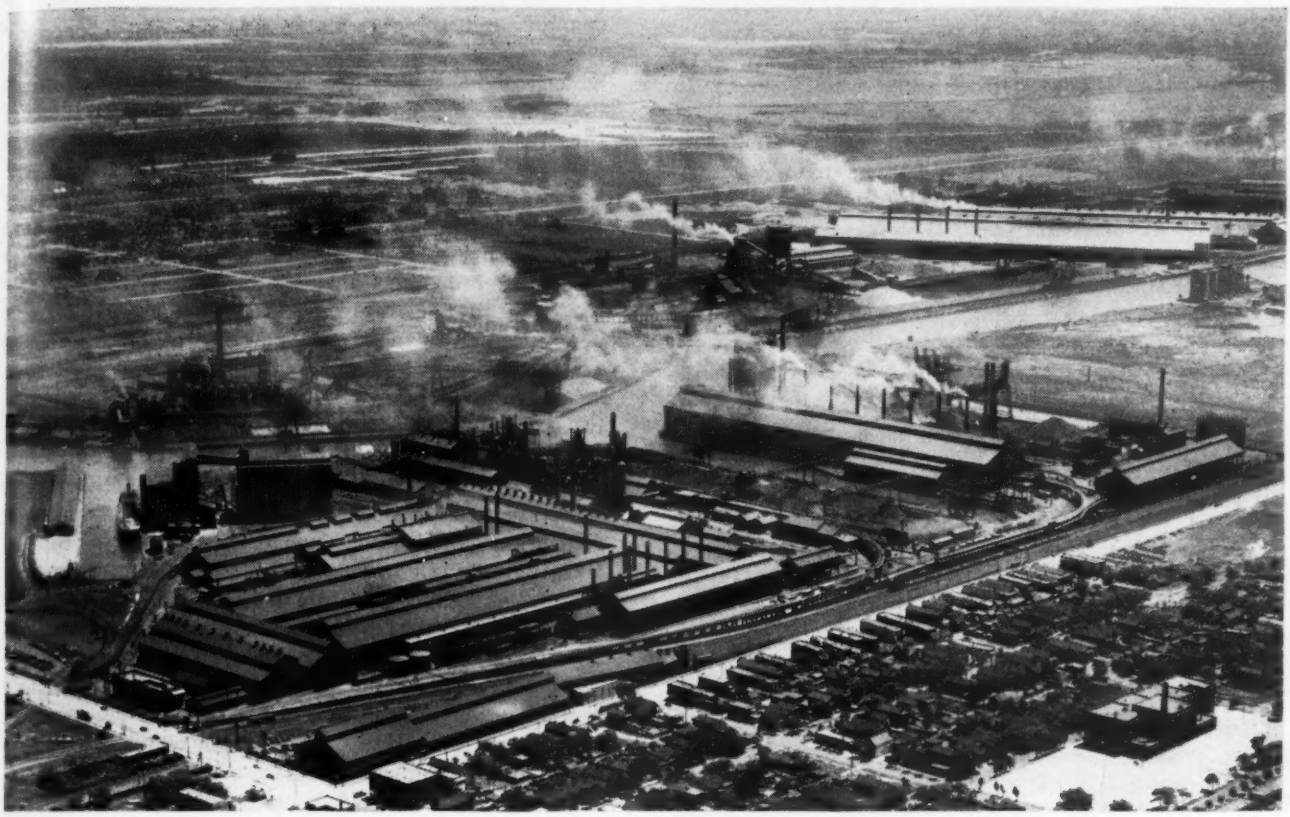
HOT and COLD-ROLLED
Strip and Sheets

ferior coating from a tightness and a resistance to corrosion standpoint and is wasteful of zinc due to dross formation. Overpickling is wasteful of acid and base metal and is conducive to hydrogen absorption with resulting embrittlement, in addition to affecting quality of the bond between the iron and zinc.

In the coating operation a crate of pickled sheets is removed from a water storage tank and placed upon the feed table from which they are singly run through the muriatic acid-dip tank whose function is to remove any rust or iron oxides remaining upon the sheet. Pinch-rolls on the delivery side of the machine convey the sheet through a set of guides to the first set of rolls in the galvanizing machine which operate in the flux box in a bath of molten ammonium chloride crystals. Balls of tallow are added to the flux from time to time to prevent the escape of ammonium chloride which is volatile at temperatures of 200 degrees F below that of the pot (825 to 850 degrees F). Function of the tallow film is similar to the action of an inhibitor used in preventing the escape of acid in a pickle tank. The sheet continues its travel through the zinc bath, controlled by suitable guides, the bottom rolls and the grooved exit rolls, until it is delivered to the spangle conveyor. Purpose of the bottom rolls is to control the course of the sheet while providing suitable distance for bringing it up to pot temperature at which the iron-zinc alloy is formed. These rolls also sweep off any flux which may be remaining on the sheet. For light gages and moderate speeds a single roll is used. For heavier gages at high speeds the travel time is lengthened by use of double bottom rolls. Best coatings are obtained with a not too heavy iron-zinc alloy layer, thus speed of sheet removal after reaching coating temperatures is important. The iron-zinc alloy is brittle and should be held to a minimum in order to provide tight coatings. It follows that as much speed as possible should be used, however, always bearing in mind that uniformity of coating is also necessary as it is effected by speed, pot temperatures, etc. Coating weight is regulated by means of grooved exit rolls which operate partially submerged in the metal and which are cleaned on each revolu-

Fig. 64—Cross-section through hot-dip galvanizing line. Wean Engineering drawing





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tion by means of a flux bath whose top is below that of the rolls. The grooving in the rolls permits the molten zinc to lie in their nip, thus providing a clean surface from which the sheet can emerge uncontaminated by flux. Sulphur dioxide fumes, made by burning sulphur in a small pot, are blown underneath the sheet as it emerges from the skimming roll and sometimes powdered ammonium chloride is blown along these rolls. Proper adjustment of these sprays plus the air spray result in improved brightness and spangle development.

The flux thickens during the operation of the pot and is skimmed at regular intervals and lumps of fresh sal ammoniac added. Dross settles to the lead bath on the bottom of the pot and is removed by skimming at intervals of one or two weeks, depending on tonnage coated. Sal ammoniac skimmings are used for making flux for dip-tinning operations and the dross is shipped to a reduction plant where the zinc is reclaimed.

The zinc coating is still in a molten state when the sheet touches the conveyor and magnet rolls are utilized to hold it in tight contact with the belt. Sudden cooling of the sheet at points of contact cause spangles to form which follow the pattern of the conveyor belt. After traveling the length of the spangle and cooling conveyors, the sheet enters a washer whose purpose is to remove any residual flux which might cause discoloration of the sheet when is is warehoused. Rubber rolls on the exit end of the washer remove the major portion of the water and the balance is evaporated in the hot air dryer. Galvanized material then passes through a roller leveler and is inspected and piled, Fig. 63. It was pointed out previously that on some lines a roller leveler precedes the washer.

Sheets that have a defective coating which can be corrected by a second passage through the pot (mended) are returned to the feeding-end and rerun.

The above operations, which seem quite simple, require a high degree of skill on the part of operating personnel, especially the supervision. The pickling, speed adjustment between the different sets of rolls in the machine which correct for different diameters, proper care and maintenance of the flux bath, the bottom and exit rolls, correct additions of spelter and tin and especially the firing of the pot are very vital factors contributing to the appearance and lasting properties of the sheet. This item is one of the highest priced carbon-steel products produced. Rigid control must be exercised at all times if the product is to meet the strict specifications which are established for galvanized sheets.

It has been recognized for a considerable number of years that the continuous hot-dip coating of steel strip would result in a product with a more uniform coating from end to end of sheet, better use of spelter, increased production and more efficient handling of base metal. One major problem had been the

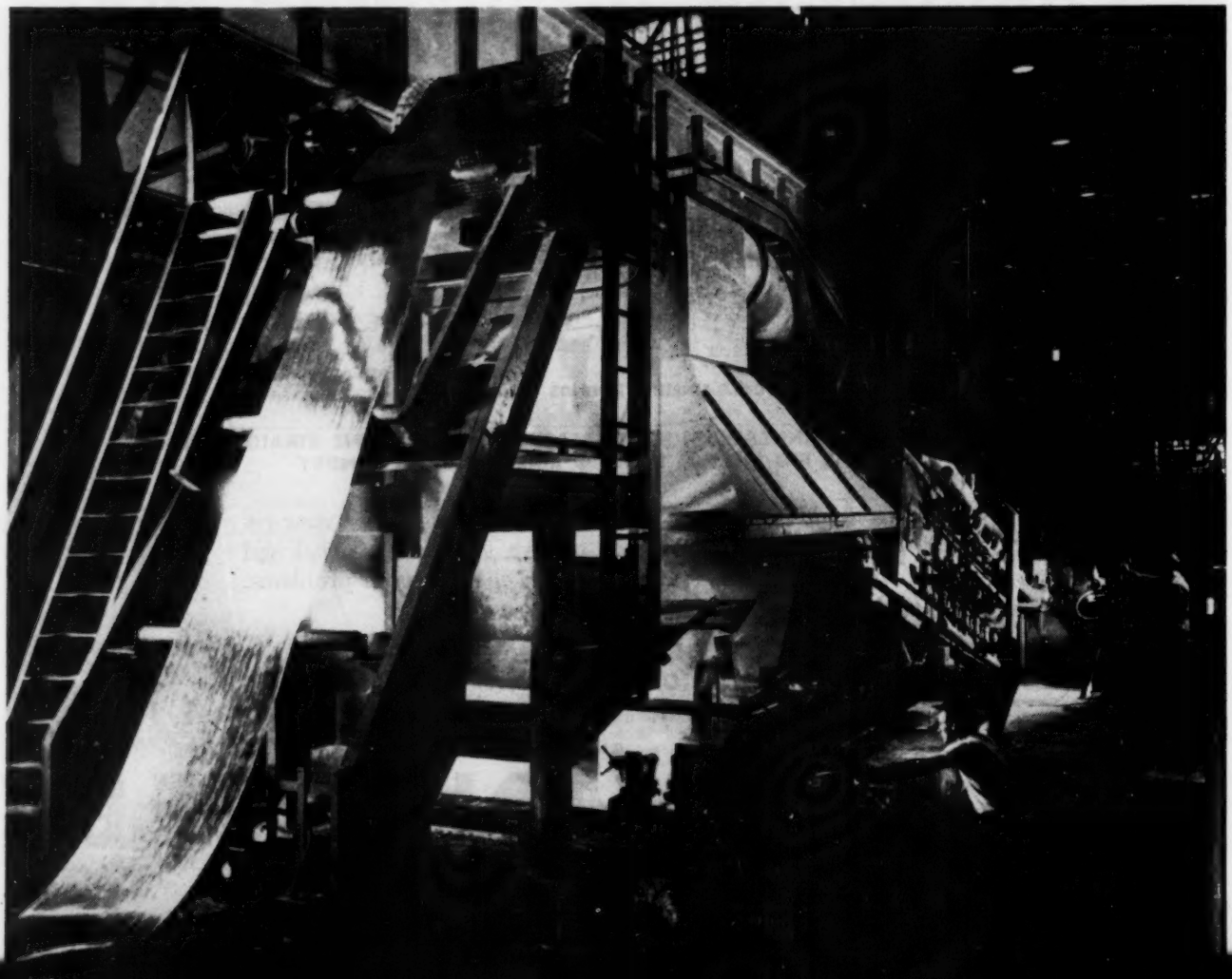


Fig. 65—View of continuous hot-dip galvanizing line showing dryer, pot, machine and spangle tower. Note electric eyes under strip for regulating the loop between spangle tower and cooling conveyor. Wean Engineering photo

Fig. 66 — Continuous hot-dip galvanizing line equipped with controlled atmosphere furnace for annealing. Carnegie-Illinois photo

synchronizing of the machine's roll speeds to compensate for variation in roll diameters. This problem was solved by the use of P.I.V. (positive infinitely variable) drives or separate motors with Ward-Leonard control. Use of either of these plans permitted the running of long sheets or sheets in coil form with no looping or stretching between the three or four sets of rolls in the machine where product flow was not visible. Considerable advance had been made in development of equipment for electrolytic cleaning and electrolytic tinning lines and the incorporation of parts of this machinery in a continuous dip galvanizing line was a logical step to take and the result of such action is outlined on Fig. 64.

It will be noted that the layout comprises nineteen units, many of which are similar in identical or modified form to those used on the previously mentioned electrolytic lines. Attention is called to the aqueous flux tank and radiant tube dryer on the pot's entry side which utilizes a zinc ammonium chloride solution rather than a sal ammonium slag flux commonly used on sheet galvanizing lines. A vertical spangle tower replaces the conventional spangle conveyor, Fig. 65. Such arrangement is necessary to provide time for the coating to set, also to provide space for changing the grooved exit rolls should it become necessary while the strip is in the machine. The addition of a second looping pit or a tower and a tension reel or an upcoiler would permit the product to be recoiled rather than cut to length.

Stock for such a line consists of cold reduced, cleaned (degreased) box annealed, deoxidized, skin-rolled strip similar to that used on an electrolytic tinning line. The line has a maximum speed of 300 feet per minute and operates at about 180 feet per minute producing 10 tons per hour of ordinary galvanized roofing and siding sheets.

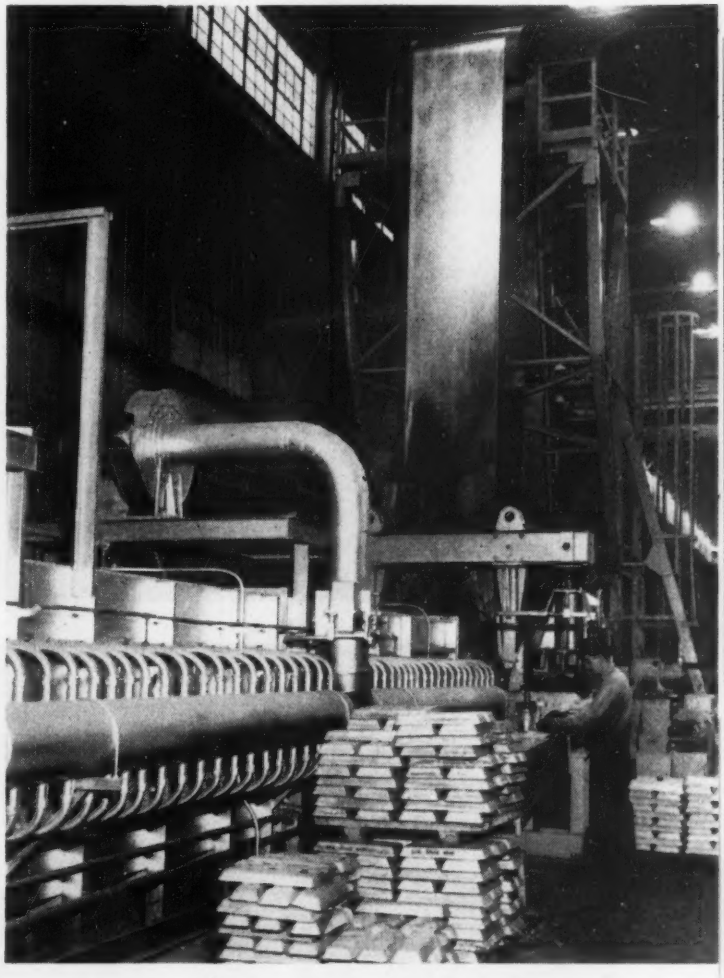
A second continuous galvanizing line, Fig. 66, was placed in operation in the Pittsburgh district in 1948 that differs fundamentally from that described above in that annealing is an integral part of the line, thereby reducing processing time from cold reduced coils to shipped product by 10 to 12 days. The annealing operation is carried out in a controlled atmosphere electric furnace, the first section employing induction heating, resistance heating then cooling.

Equipment comprising the line consists of: Uncoiler, crop shear, welder, dryer, electrolytic cleaning, looper, drag bridle, high-frequency induction furnace, resistance-type furnace, cooling section, hot-dip pot Fig. 67, cooling section, leveler, bonderizing unit, dryer, shallow loop, leveler, shear, leveler, piler, and dryer. Overall length of the line is 475 ft.

The line is designed to accommodate widths from 20 to 54 inches and from 11 to 18 gage in thickness. A very wide speed range, 8 to 120 feet per minute is provided to handle various gages. A production of approximately 300 tons per 24 hour day is obtained. A duplicate line to handle the range from 19 to 30 gage is being installed and will be in operation in 1949.

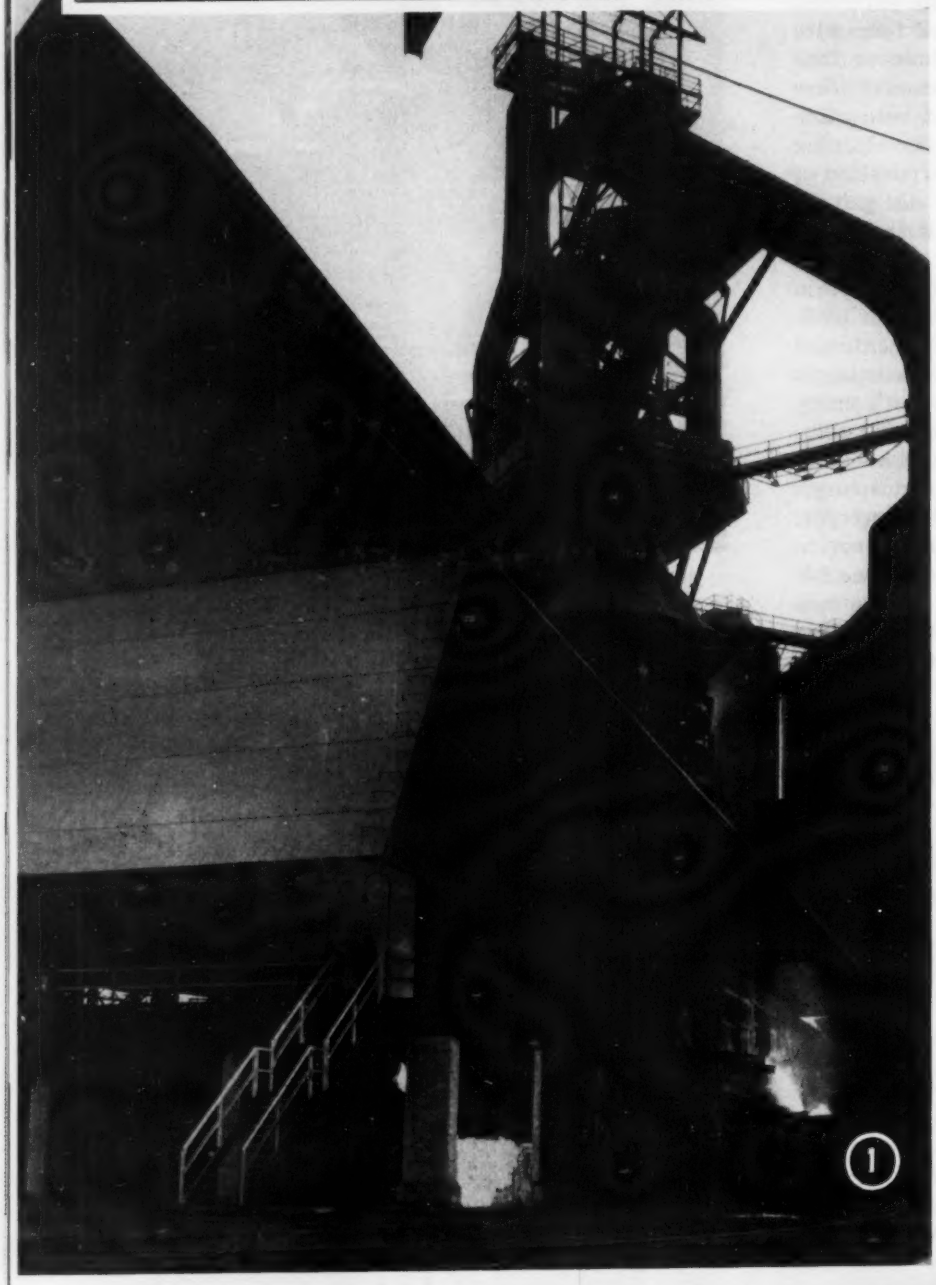
(To be continued)

Fig. 67—Below, exit end of continuous annealing furnace, galvanizing pot and spangle tower of a continuous hot-dip line. Carnegie-Illinois photo



Expansion Program Increases Capacity

At Bethlehem's Sparrows Point Plant



Expansion of facilities in the coke, blast furnace and open hearth departments together with many newly installed and revamped rolling units has made this plant the second largest operation in the industry

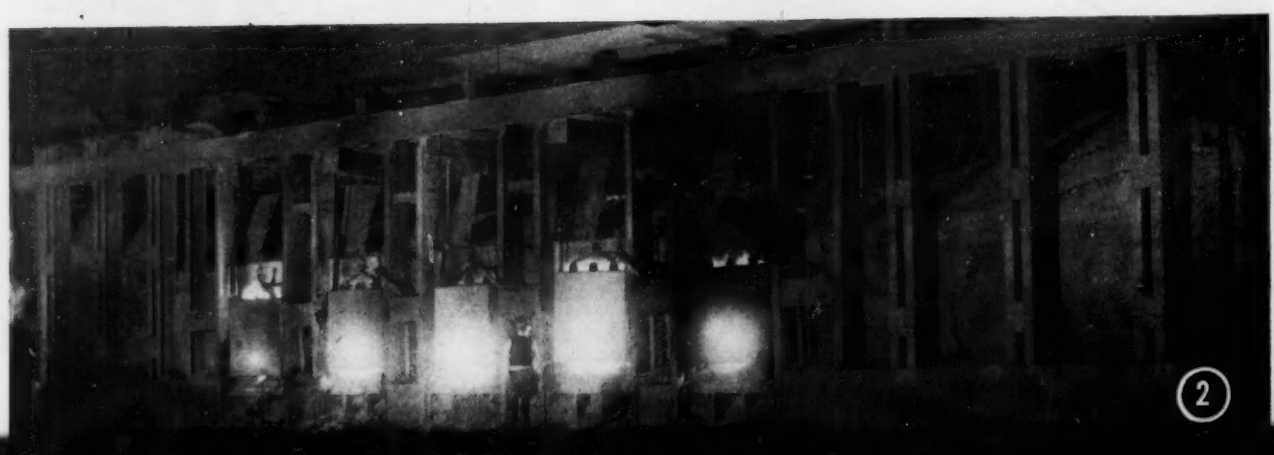
COKE, pig iron and ingot capacity have been substantially increased at the Sparrows Point, Md. plant of Bethlehem Steel Co., reflecting a far-sighted, plant-wide expansion program undertaken by the company during the last 11 years.

Coke capacity was increased from 1,775,000 to 2,520,000 net tons, an increase of 42 per cent; pig iron capacity was up from 2,105,000 to 3,252,000 net tons, an increase of 54.5 per cent; and ingot capacity was improved from 3,320,000 to 4,666,000 net tons, an increase of 40.5 per cent. This now places the plant as the second largest operation within the industry.

To the 361 coke ovens in operation during 1938, have been added two new batteries totalling 122, low differential regenerative under-jet ovens. Each 24 hours, 162 ovens coke 3094 tons of coal. A new battery of 65 underjet ovens with double collection mains and equipped for raw gas re-

Fig. 1 — Blast furnace which was put into operation during 1948

Fig. 2—View of new unit installed at No. 3 open hearth



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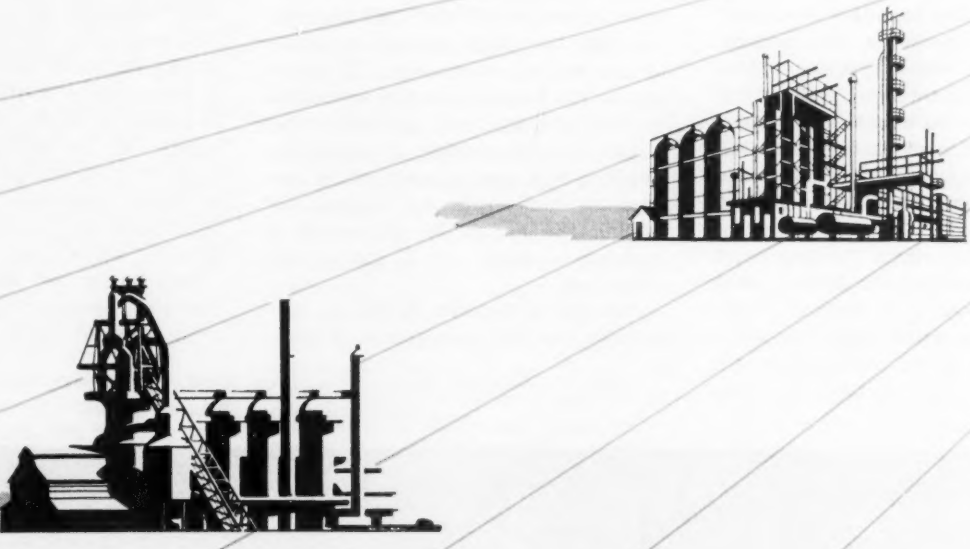
The cooperative experience and close relationship of the two divisions has proved advantageous to McKee clients in both industries.



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circulation are under construction today.

By-product equipment put in operation included four primary coolers, four turbo-exhausters, five electric precipitators, two flushing liquor decanter tanks, two tar and ammonia collecting tanks, two gas compressors, twelve banks of shell and two ammonia liquor circulating coolers, one 7-foot ammonia still, one sulphide dryer and one pyridine plant.

New equipment for the refining of light oil includes one carbon disulphide rectifying column and condenser, two nitration benzol rectifying columns and condensers, one pure toluol and xylol column, one 30,000 gallon pure toluol and xylol still kettle, two vapor neutralizers, one toluol and xylol condenser, one crude products rectifying column, one 10,000-gallon crude products still kettle, two 10,000-gallon agitators, two 500,000-gallon benzol storage tanks, one 150,000-gallon benzol storage tank, one 100,000-gallon benzol storage tank, one 350,000-gallon toluol storage tank, one 100,000-gallon xylol storage tank and other tanks for crude and intermediate products, acid and caustic soda.

New Furnaces Installed — During the expansion program, the company installed two blast furnaces which brings today's total to eight. "G" furnace was constructed having a hearth diameter of 25 feet 9 inches, a bosh diameter of 29 feet 6 inches, and a stock line diameter of 20 feet. Furnace height is 102 feet from iron notch to the top ring. The iron notch is 18 inches above the bottom with the cinder notch 4 feet 2 inches above the iron notch. Spaced around the furnace three feet above the cinder notch are 16 tuyeres. Crucible section has a total height of 10 feet 5 inches. This unit is serviced by four stoves 22 feet in diameter by 125 feet high, each affording 133,000 sq ft of heating surface.

The company's "H" furnace was put into blast in 1948 and recently established the world record for the production of pig iron at 54,336 net tons, an average of approximately 1753 tons per day. This unit has a hearth of 28 feet diameter, a bosh of 31 feet 7½ inches diameter and a stock line 21 feet 6 inches in diameter. Distance from iron notch to the top ring is 105 feet. Hearth section totals 10 feet 5 inches in height with the iron notch 18 inches above the bottom. The cinder notch 4 feet 2 inches above the iron notch and the 20 tuyeres are spaced around the furnace 3 feet above the cinder notch.

To the blowing facilities which previously had included 14 gas drill and blowing engines, three steam driven turbo blowers and 4 vertical steam driven blowing engines, were added three condensing turbo blowers, each rated at 100,000 cfm and 30 psi and operating on steam at 250 psi, 650° F. These new units serve furnaces "G" and "H" and are tied into the older units as a standby in case of emergency. To serve four of the furnaces then in operation in 1942, new dry-blast equipment was installed which consists of four units, totalling 950 tons capacity using low pressure refrigerant and capable of cooling the air to 41° F, giving a moisture content of 3 grains per cubic foot.

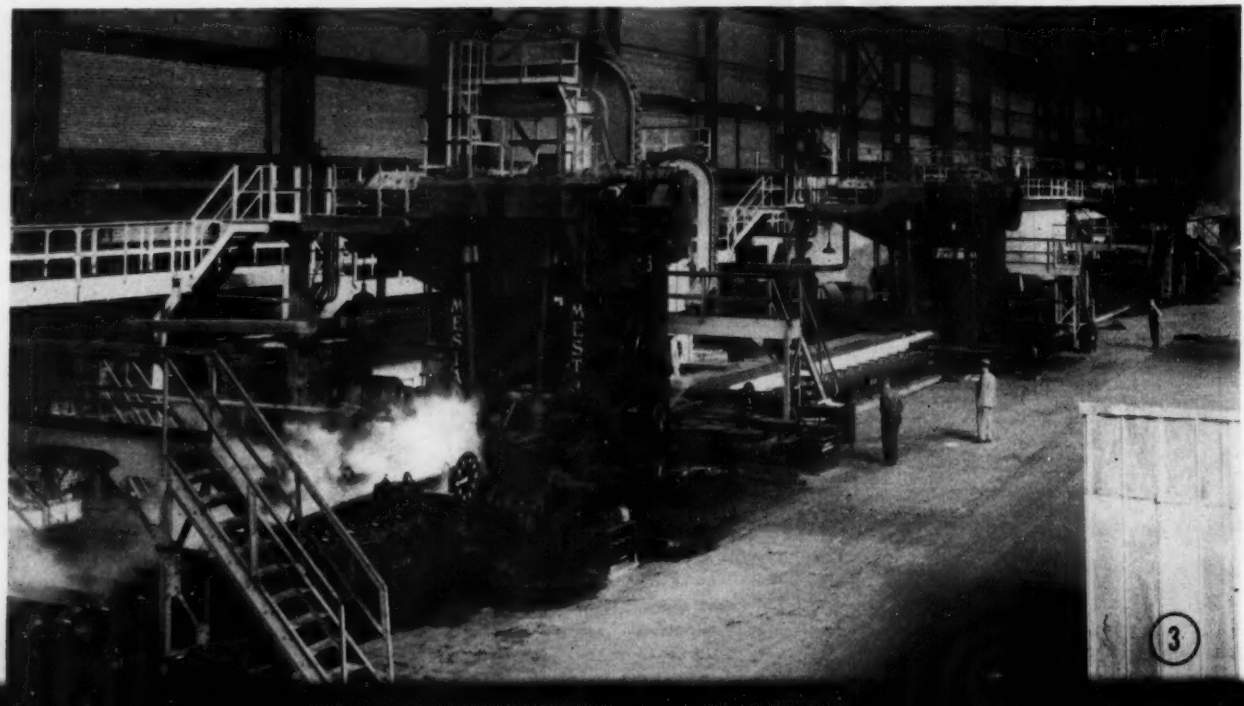
Five Open Hearths Added — Expansion in the open-hearth department took place in No. 3 shop originally consisting of 6 furnaces. The new units added were 5 furnaces, 82 feet 7 inches long and 22 feet 3½ inches wide, having hearth dimensions at the foreplate line of 47 feet by 15 feet 9 inches affording a bath area of 742 sq ft. Hearths are built up with 1 inch of loam, 4½ inches of fire clay brick, 13½ inches of chrome brick and 18 inches of a burnt-in mixture of 80 per cent ground magnesite and 20 per cent fine open-hearth slag. Bath depth at the tap hole is approximately 27 inches. Bunker C fuel oil is used by multijet steam atomizing burners. Oil flows from a central storage to the individual heaters at each furnace, where its temperature is automatically brought to 200° F.

No changes have been made to the original three 20-ton bessemer converters which provide the company an ingot-making capacity of 312,000 net tons annually.

Late in 1947 a new 68-inch continuous hot-strip mill went into operation. Designed for a capacity of 140,000 tons monthly, the unit rolls slabs 20 to 61 inches in width, 4½ to 6½ inches thick and 7 to 22 feet long, weighing up to 27,600 pounds. This mill produces 18 gage strip in widths up to 42 inches, 16 gage up to 48 inches in width, 14 gage up to 54 inches in width, and 12 gage and heavier up to 60 inches in width. A much wider range of products can be rolled than was formerly available from the 56-inch hot strip mill installed some years ago.

Description of Hot Strip Mill— Three continuous triple-fired furnaces with a rated capacity of 110 tons

Fig. 3—General view of roughing stands of recently installed 68-inch continuous hot sheet-strip mill



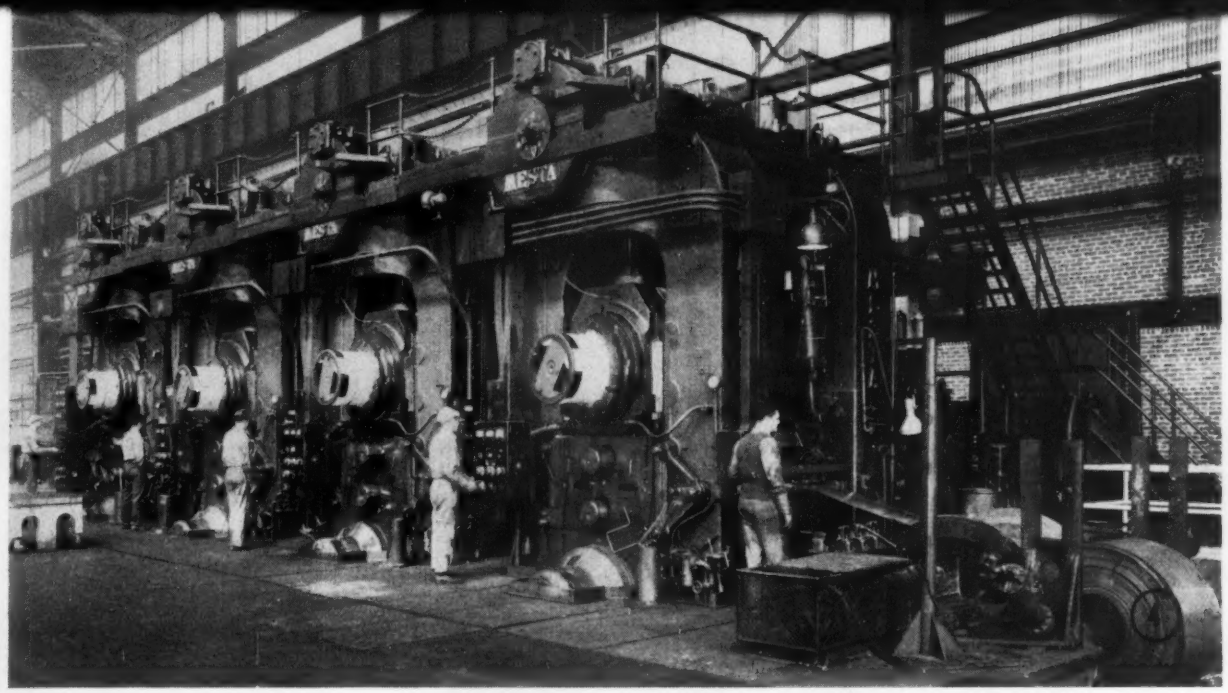


Fig. 4—Entry end of new 56-inch tandem cold reduction mill

per hour furnish the slabs for the hot-strip mill. The mill consists of a vertical edger containing 40-inch diameter rolls and driven by an 800 hp, 514 rpm, 440 v ac motor. Next follows the first roughing stand, a 2-high, 36 x 70-inch unit, driven by 2000 hp, 150 rpm, 6600 v ac motor. Following this are four roughers of 4-high construction, which have 34 to 38-inch by 69-inch work rolls and 53 x 64-inch back-up rolls. The first mill is driven by a 3500 hp, 144 rpm motor, the second by a 4500 hp, 257 rpm motor and each of the next two by 4500 hp, 400 rpm motors all at 6600 v ac. The last three roughers contain integral vertical edging rolls, driven by a 150 hp, 450 rpm, 230 v dc motor, mounted on top of the mill housing and equipped with forced ventilation. At the end of the delay table is located a rotary crop shear just ahead of the finishing train. Following the table is the finishing train, which consists of a 2-high, 25½ x 68 inch scale breaker driven by a 500 hp, 150/600-rpm, 600 v, dc motor, and followed at a distance of 18 feet by the finishing train, which consists of six 4-high stands on 18-foot centers. These mills use 27 x 69-inch work rolls and 43 x 64-inch back-up rolls being driven by 600 v, dc motors. The motors are respectively: 125/250, 125/250, 80/160, 100/200, 125/250, and 150/300 rpm. The 4-high mills are provided with roller bearings on work roll necks and oil-film bearings on back-up rolls. Roller bearings are used on the roll necks of the vertical edger and composition bearings are used on the 2-high rougher and finishing scale breaker. A hot flying shear is located after the last finishing stand and is driven by a 900 hp, 300 rpm, 600 v dc motor and is able to cut the strip into any desired length between 16½ and 33 feet. The runout table extends 360 feet past the end of the last finishing stand to the 2 downcoilers and on 270 feet more to a sheet piler where material cut to length on the flying shear is piled.

Hot strip finishing equipment installed at the time of the erection of the 68-inch hot strip mill consists of a shearing line, made up of a sheet charger, leveler, side trimmer, up-cut shear, another leveler and a piler and arranged so that they can deliver either into the end of the hot mill building or into another processing building. In the vicinity are also installed two shearing lines which consist of a processing end coiler, side trimmer rotary shear, leveler and piler. In addition there are installed a four-arm plunger type batch pickler, a scrubbing-leveling line, a resquaring-scrubbing line, a slitting line, oiling machines and four resquaring shears.

Pickling Lines Installed—Two new continuous pickling lines having a total capacity of 75,000 tons per month, are provided to process coils prior to cold reduction. Equipment in each line consists of coil feeder, a pinch-roll processor, an up-cut shear, a stationary-die flashwelder and weld trimmer, a stitcher, a looping pit, five acid tanks, two rinse tanks, a drier, a shear and a recoiler.

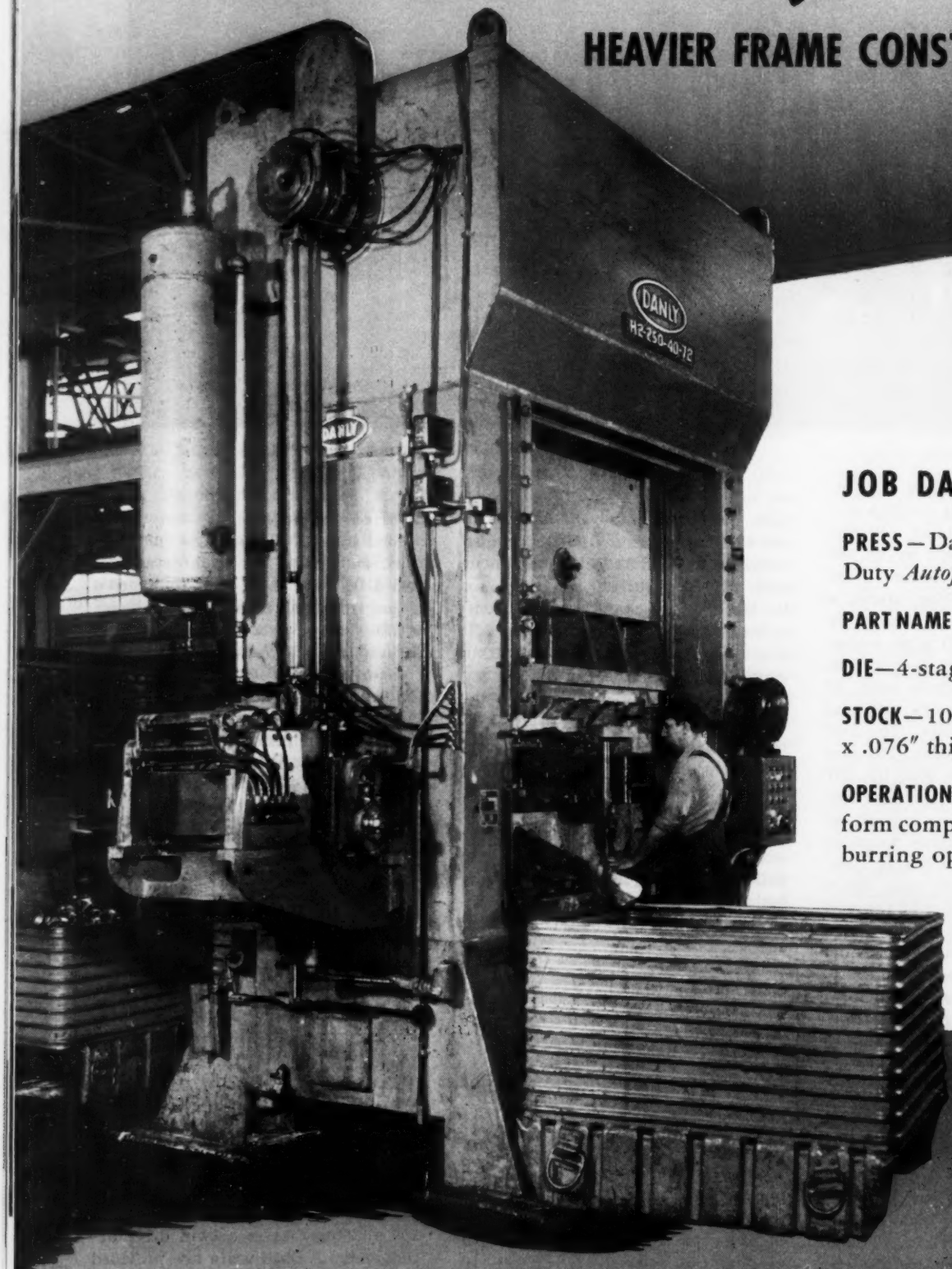
A 4-high, four stand tandem cold reduction mill started operation the middle of January 1947. The forged steel work rolls are 21 x 56 inches and the mill uses cast steel back-up rolls 56 x 51 inches. The first stand is driven by a 2000 hp motor, the second by a 2500 hp motor, and the third and fourth are each driven by two 1500 hp motors in a twin drive arrangement, all of the motors being of 750 v dc. Power for the motors is secured from a motor generator set composed of two 4000 kw 750 v generators driven at 300 rpm by a 11,200 hp synchronous motor. Mill screw downs on each stand are driven by two 50 hp dc motors connected by magnetic clutches. Work roll necks use roller bearings as well as the pinion stands and gear sets, while oil-film bearings are used on back-up roll necks. Having a nominal capacity of 56,000 tons per month, the mill can roll strip down to 28 gage and widths up to 40 inches, and to 31 gage in widths up to 36 inches.

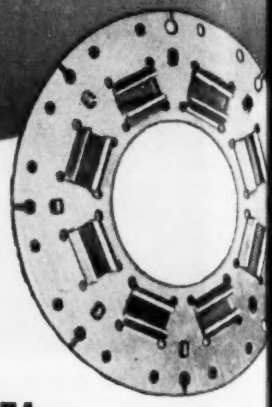
Coils are annealed in 26 direct-fired cover-type furnaces 24 feet ½-inch long by 9 feet 6½ inches wide, inside measurements. To secure the desired temper and surface finish, two skin pass mills have been installed for rolling of the annealed product. These are 4-high single stand units using 21 x 56 inch work rolls and 56 x 51-inch back-up rolls. Each stand is driven direct by two 400 hp, 350 v dc motors in a twin drive arrangement. Both units are provided with payoff and tension reels and one of the two is also equipped with sheet handling facilities. One motor generator set provides current for both mills, with one 650 kw generator for each mill drive and one 500 kw generator for each reel drive. Also included in this setup are four classifying shear lines and one gang slitter.

(*Please turn to Page* 122)

FASTER SPEED OF *Autofeed* PRESS

HEAVIER FRAME CONSTRUCTION





JOB DATA:

PRESS—Danly 250-ton Heavy Duty *Autofeed*

PART NAME—Clutch driven plate

DIE—4-stage progressive

STOCK—1020 CRS, 6⅛″ wide x .076″ thick, coil..

OPERATIONS—Blank, pierce and form complete. (No subsequent burring operation required)

This Danly 250-ton Heavy Duty Autofeed press produces both finished stampings shown on the inspection table (opposite page). Formerly, each stamping was made on a separate press.

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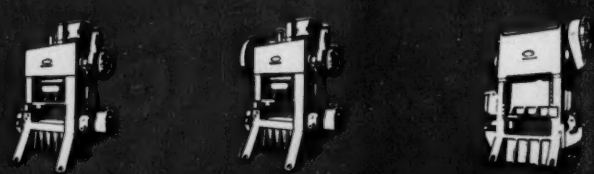


INCREASES PRODUCTION...TRIPLES DIE LIFE

REDUCES VIBRATION AND BED DEFLECTION

PERMITTING LONG RUNS AT HIGHER SPEED

THIS AUTOMOTIVE stamping was formerly produced on a press of the same tonnage at 20 strokes per minute. Now, on a Danly Heavy Duty *Autofeed* press, the speed has been tripled to 60 strokes per minute. In addition to increasing production, three times as many parts are produced between die grinds, and burring has been substantially reduced. Quality has been improved while reducing direct production costs.

All Heavy Duty *Autofeed* presses are designed throughout for faster, automatic stamping of parts. The entire frame is constructed heavier for the rated capacity of the press, reducing vibration at higher operating speeds. The result is longer uninterrupted runs, better die performance and higher product quality.

Production Increased—Heavier frame construction permits taking full advantage of automatic feed through progressive dies completing numerous operations in one press. Handling is reduced—one press does the work of several presses.

Maintenance Costs Reduced—The Danly air-cooled, air-operated clutch and brake operate for prolonged periods without maintenance. Friction discs responsible for clutching and braking action are not subjected to the disintegrating effects of high temperatures.

Automatic lubrication flushes all bearings in crown and slide, including gibs, substantially increasing the prime life and top performance of the press.

EXCLUSIVE DANLY FEATURES POINT TO LOWER STAMPING COSTS

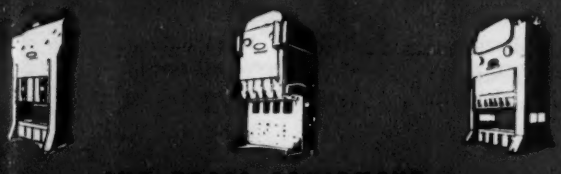
Die Tryouts Facilitated—Special Danly controls and unusual clutch sensitivity inherent in Danly design permit closer, more accurate "inching" during die tryouts. This saves time and adds safety in getting dies spotted and in production.

Inspection operation showing both clutch plates and lamp mounting brackets in place on gages. These parts are alternately produced on the Danly Autofeed Press.

WRITE FOR COMPLETE INFORMATION

Consult Danly Engineers for the most efficient presses to meet any requirement from 50 tons up. Danly Straight-Side, Single Action, Double Action and Gap Frame Presses are also setting production records throughout industry today.

Write now for catalog on Danly presses which can lead to real cost savings in your press shop.



OVER 25 YEARS OF DEPENDABLE
SERVICE TO THE STAMPING INDUSTRY

Electroplaters' Convention

. . . features five educational sessions, including a symposium on the business of plating

FIVE educational sessions featured the 36th annual convention of the American Electroplaters' Society at Hotel Schroeder, Milwaukee, June 28-July 1. The initial session dealt with economic matters confronting the plating industry, the succeeding three confined attention to technical problems and practices, and the concluding session focused attention on the subject of research. In addition, the convention program embraced two business sessions, the annual banquet and several social events.

Arthur W. Logozzo, president, Nutmeg Chrome Corp., Hartford, Conn., was elected president of the society to succeed Samuel S. Johnston, technical director, electrolytic department, Weirton Steel Co., Weirton, W. Va. During the past year, Mr. Logozzo served as first vice president. William J. Neill, general superintendent, Columbus Metal Products Co., Columbus, O., was advanced from second to first vice president; and C. F. Nixon, director of process engineering, Ternsted Division, General Motors Corp., Detroit, from third to second vice president. Newly elected third vice president is Franklyn J. MacStoker, Ferrand Optical Co., New York. A. Kenneth Graham, Jenkintown, Pa., continues as executive secretary.

Medal Awards — Several medal awards were announced at the banquet. The Founder's Gold Medal went to W. A. Wesley, assistant director, and W. W. Sellers and E. J. Roehl, chemist, research laboratory, International Nickel Co. Inc., Bayonne, N. J., for their paper, "Electrodeposition of Nickel at High Current Densities," presented at this year's convention.

C. F. Nixon was recipient of the A.E.S. Gold Medal for his paper, "The Plater's View of Designing."

The Plating Award was conferred upon Lyman Sperry and Maurice Caldwell, Doehler-Jarvis Corp., Grand Rapids, Mich., for their paper, "Destruction of Cyanide Copper Solutions by Hot Electrolysis."

The Mechanical Finishing Award of the A.E.S., sponsored by Lea Mfg. Co., Waterbury, Conn., was won by Arthur P. Shultze, for his paper, "Mechanical Finishing with Roto-Finish Technique."

The Chromium Plating Award of the A.E.S., sponsored by Nutmeg Chrome Corp., Hartford, Conn., was made to Robert Seegmiller and Vernon A. Lamb, National Bureau of Standards, Washington, for their paper, "Oxidation of Trivalent Chromium in Chromic Acid Plating Baths," presented at the 1948 convention in Atlantic City.

Business of Plating—The symposium on "Business of Plating" was an innovation at this year's convention, for ordinarily the society confines its attention to technical matters. The general situation facing industry currently, namely declining business volume and return of the buyers' market made consideration of economic topics particularly apropos.

Under chairmanship of Walter L. Pinner, director of research, Houdaille-Hershey Corp., Detroit, the symposium was opened by Thor H. Westby and Robert E. Parkinson, merchandise testing and development laboratory, Sears, Roebuck & Co., Chicago, who co-authored a paper on "The Customer Looks at Plated Products." The authors discussed Sears-Roebuck plating specifications at some length and observed that more work needs to be done in correlating laboratory results with performance in actual practice. Need for grade labeling was also pointed out. Sears-Roebuck currently is attempting to inaugurate grade labeling, particularly in automotive accessories.

"Process Control in Electroplating" was the subject of a paper by R. E. Harr, Western Electric Co., Chicago. This dealt with (1) maintenance of solutions and equipment, including tests and additions to control major solution constituents, spectrographic and other tests for kind and amount of impurities, and rack design and maintenance; and (2) inspection, including use of Magne-gage and sectioning to determine deposit thickness, relation of minimum to maximum deposit thickness, establishment of control limits for thickness and use of control charts in maintaining it within such limits, and finish allowances for threaded parts.

Raymond M. Shock, executive secretary, National Association of Metal Finishers Inc., Detroit, discussed "The Job Plating Business." In surveying the role of the job shop in the industry, he said in the country's heavily industrial areas, such as Chicago, Detroit and eastern cities, the job shop accounts for about 20 per cent of electroplating capacity, the balance being provided by captive shops. In less industrialized areas, such as the south, capacity is almost entirely in job shops.

As would be expected, Mr. Shock pointed out, the continuing decline in business activity is affecting job shops more pronouncedly than captive shops, the latter are now taking back into their own establishments work which for a considerable period had been farmed out to jobbing shops on a contract basis. The jobbing shops serve an important role in the industrial picture and their security must be provided. Over the long pull, there is little apprehension over business volume although at the moment jobbing shops are suffering from low volume.

Plating Materials—Concluding portion of the symposium was devoted to the "Availability of Plating Materials," with eight speakers presenting thumb-nail pictures of their respective fields. Speakers and subjects were as follows: "Alkalies, Including Silicates and Phosphates"—J. J. Duffy Jr., manager of sales, special chemicals division, Pennsylvania Salt Mfg. Co., Philadelphia; "Cadmium"—L. K. Lindahl, president, Udylite Corp., Detroit: "Chromic Acid and Chromates" — Henry Mahlstedt, manager, plating division, United Chromium Inc., New York; "Cyanides"—Ed McGroven, manager, sodium products division, E. I. du Pont de Nemours & Co., Wilmington, Del.; "Lead"— Charles R. Ince, manager, metal sales department, St. Joseph Lead Co., New York; "Nickel"—Clarence H. Sample, nickel sales department, International Nickel Co. Inc., New York; "Tin"—Dr. B. W. Ginser, manager, Tin Research Institute Inc., Columbus, O.; and "Zinc"—Ralph F. Burns, metal division, New Jersey Zinc Sales Co., Chicago.

Only two materials, namely cadmium and lead, appear to fall in the scarce category. Cadmium is a by-product derived in connection with zinc ore mining and refining and its popularity as a plating material creates a demand which outruns zinc output. For this reason, its production in required volume is doubtful. Sharp drops in lead price are resulting in closing down lead mines, particularly those which are submarginal properties; the question arises, therefore, as to whether production of this metal will be adequate to serve all needs.

Symposium conducted at the sec-

The jet gun that hunts for oil

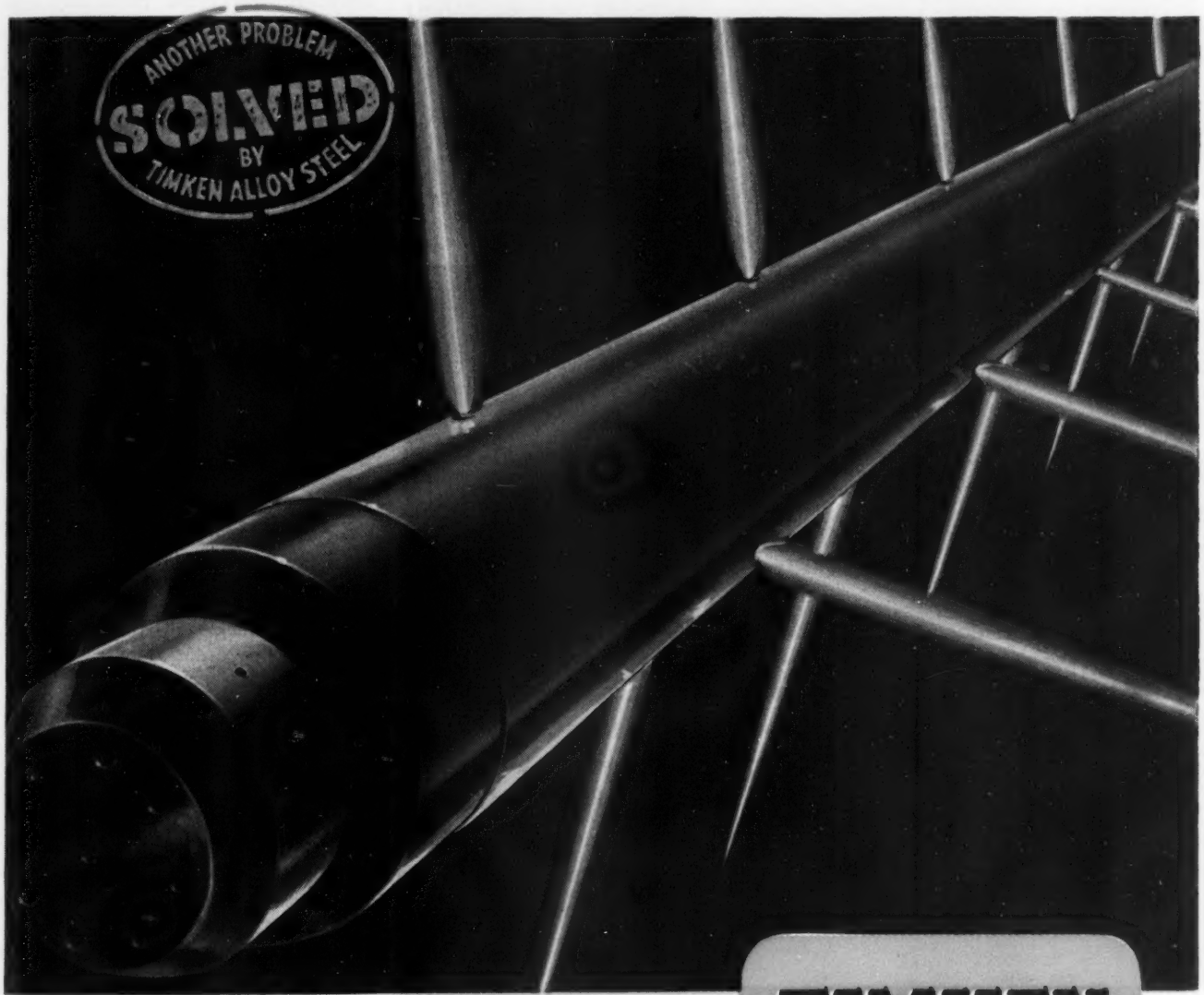
OIL field men have borrowed an idea from the tank-destroying "bazooka" gun of World War II to vastly increase the flow of oil from underground reservoirs.

A piece of steel tubing about seven feet long and perforated with 24 ports is lowered into the well. The ports are sealed, and behind each seal is a special conical high-explosive charge which, when detonated electrically, fires a jet of high-speed, fast-burning gases, just like the warhead of a "bazooka". This is powerful enough to punch through steel pipe and cement, deep into the surrounding strata, forming a funnel for the gushing oil.

To make this jet gun possible, a steel had to be found that would not split or rupture, and would bulge a minimum amount under the shock of explosive pressures much greater than those in the breech of an artillery gun.

Testing a wide variety of steels, oil tool manufacturers found the answer in Timken fine alloy seamless tubing. Hardened to exactly the right degree, it resisted rupture and bulging after repeated firings better than materials previously used. Today, leading users of perforating guns use Timken tubing for the job.

Here is yet another example of an unusual problem in industry that has now been stamped "Solved—by Timken Alloy Steel". No other alloy steel producer can equal this record of tough steel problems solved. Why not let us go to work on *your* steel problems today? Write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".



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FOLLANSBEE COLD ROLLED STRIP is manufactured in a range of tempers, and with the proper finish, for making turners, mixers, beaters, and a myriad other profitable specialties. Custom-made Follansbee Cold Rolled Strip, in continuous coils, is furnished to your specifications. You should be taking advantage of the machining quality of Follansbee Cold Rolled Strip and Follansbee Polished Blue Strip. Just call the Follansbee Steel Representative nearest you.

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Plants—Follansbee, W. Va., and Toronto, Ohio.
Follansbee Metal Warehouses—Pittsburgh, Pa., Rochester, N. Y., and Fairfield, Conn.

ond educational session dealt with "Copper, Nickel and Chromium Plating." Frank K. Savage, Graham, Crowley & Associates Inc., Chicago, served as chairman. First paper, by George W. Jernstedt, manager of electroplating projects, Westinghouse Electric Corp., East Pittsburgh, Pa., was "PR Cyanide Copper Plating," in which the speaker gave conditions, including time cycles and ratios, solution composition, addition agents, etc., for the method.

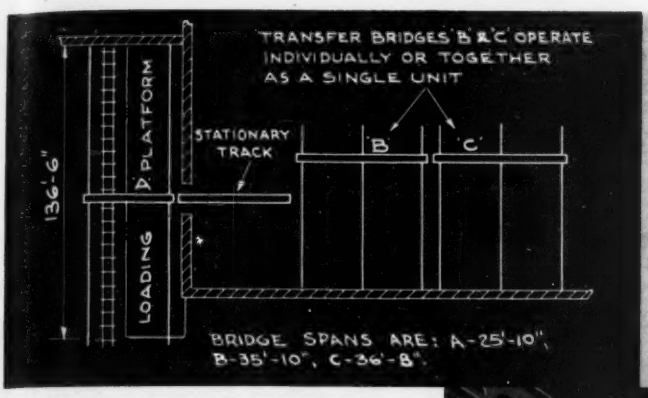
Electrodeposition of Nickel—"Electrodeposition of Nickel at High Current Densities" was subject of a contribution, mentioned previously, by W. A. Wesley, W. W. Sellers and E. J. Roehl. The theory of limiting current densities was applied to nickel deposition and led to the conclusion that it is theoretically possible to plate nickel at rates as high as 8500 asf. The practical limit would, therefore, be set not by electrochemical factors but by such engineering requirements as maintenance of an adequate rate of motion of the electrolyte versus the cathode surface, prevention of overheating of contacts, electrolyte and cathode.

In a controlled-flow apparatus, it was stated, sound nickel deposits were actually made at the rate of 0.001-inch in 16 seconds from the chloride bath, with high anode and cathode efficiencies. Such deposits proved to be less ductile than those made at normal rates but were of good protective value in porosity. Data were presented which should be useful in designing equipment for high-speed nickel plating and even for increasing ordinary rates by providing uniform motion.

"Factors That Influence Operating Characteristics of Chromium Baths" was subject of a paper by J. B. Winters, research chemist, and R. O. Hull, president, R. O. Hull & Co., Cleveland. This dealt with the wide variation in results obtained in chromium plating, particularly over nickel.

Scratch Hardness—Scratch hardness of chromium electrodeposited under a wide range of conditions as determined by the Bierbaum microcharacter was discussed in a paper, "Scratch Hardness and Abrasion Hardness of Electrodeposited Chromium," by J. M. Hosdowich, chief chemist, United Chromium Inc., New York. The abrasion hardness of chromium was determined by means of an automatic machine in which a grinding wheel was intermittently brought in contact with the test piece.

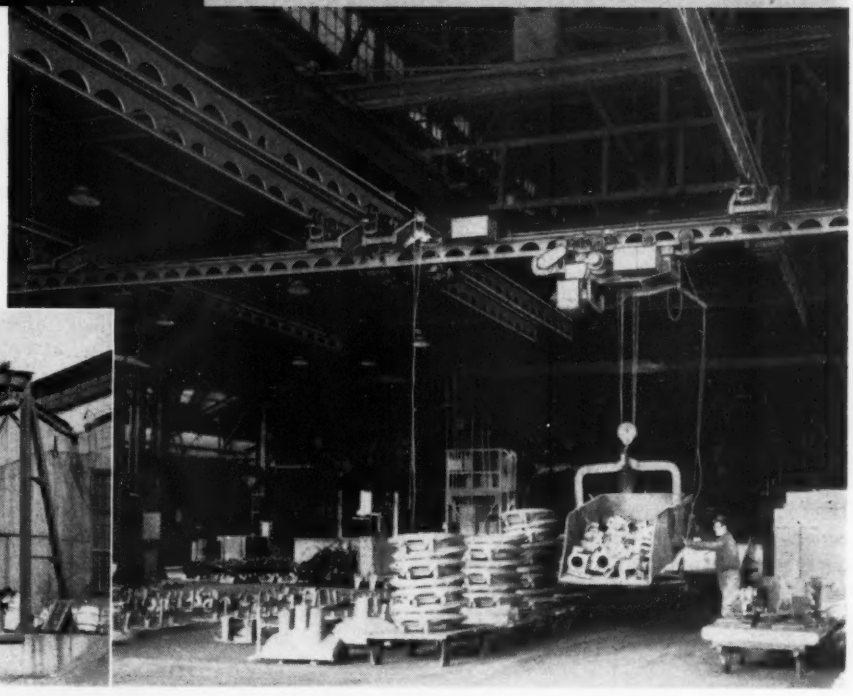
A conclusion of practical value to the chromium plater is that both scratch hardness and abrasion hard-

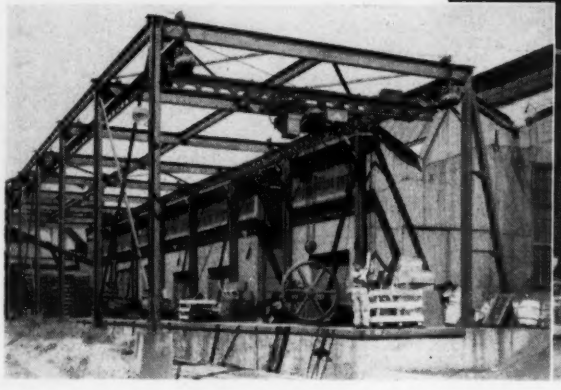


5 TON TRANSFER BRIDGE SYSTEM with Advanced Features

(At right) The two inside bridges are shown interlocked and being operated as a single unit. Either bridge may be operated individually. All control is centralized in the push button station suspended from the carrier.

(Below) The outside bridge serving the loading dock interlocks with inside track at doorway.





CASTINGS can be picked up at any point in the large shipping room, and loaded onto railroad cars or trucks at the outside of the building with this efficient 5-ton transfer bridge system. The bridges and stationary track interlock, enabling the motor-driven carrier to operate on any bridge.

The two inside bridges can be operated individually or together as a single unit, and controlled completely by means of the pendant push-button station on the carrier. This permits operating the bridges separately for local work in the bays each covers. When transporting materials from one bay to the other, time is saved by operating the bridges interlocked as a single unit because then it is not necessary to travel the bridges extra distances in order to interlock them for transfer of a carrier.

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OVERHEAD MATERIALS HANDLING EQUIPMENT

ness of any chromium deposit can be estimated accurately from its appearance, regardless of the temperature and current density under which it was deposited.

The roundtable discussion conducted at the third educational session dealt with "Acid Dips in Cleaning Cycles." Chairman was William Blum, assistant chief, chemistry division, National Bureau of Standards, Washington. Ivan C. Hepfer, president, Furniture City Plating Co., Grand Rapids, Mich., started off the topic with a discussion on "Acid Dips for Ferrous Metals." Mr. Hepfer commented that electrolytic pickling is more rapid than ordinary pickling and is widely used. Electropolishing solutions, similar to electropickling, are used occasionally. Acid dips are selected upon the basis of amount of rust on scale to be removed. One discussor commented that phosphoric acid should not be overlooked when organic finishes are to be applied, this acid producing less rusting after cleaning.

"Prevention of Embrittlement of High-Carbon Steel" was discussed by Richard M. Wick, Bethlehem Steel Co., Bethlehem, Pa. Cleaning of high-carbon steel is similar to that for low-carbon steel, the speaker commented, but in the former there is always danger of embrittlement from hydrogen penetration. It is necessary, therefore, to work out the procedure most suitable for the article being produced. For hard chrome plating, removal of scale by mechanical means, such as sand or shot blasting, frequently is more desirable than acid cleaning.

At this point, Dr. Blum veered discussion around to the question of measuring embrittlement. The Bureau of Standards, he said, was asked during the war by the Bureau of Aeronautics whether cadmium plating or zinc plating causes the most embrittlement in steel. No clear method has yet been developed for measuring the degree of embrittlement caused by hydrogen penetration.

Acid Dips for Copper—"Acid Dips for Copper and Copper-Base Alloys" was considered in a contribution prepared by B. H. McGar, assistant director of research, Chase Brass & Copper Co. Inc., Waterbury. Conn., and presented by F. D. Eddy of the same company. His discussion covered pickling, stain removal and bright dipping methods.

Dwight M. Overcash, Brown-Lipe-Chapin Division, General Motors Corp., Elyria, O., presented a discussion on "Acid Dips for Zinc-Base Metals." He gave a brief literature survey and reported results of a questionnaire on present practices in cleaning die castings. His comparison of practice of 12 years ago with that of today revealed that acid dips now are more dilute than formerly, particularly in automatic equipment.

"Plating and Other Treatments of Light Metals" was the topic of the symposium conducted at the fourth educational session. K. Gustaf Soderberg, editor, *Plating,* Jenkintown, Pa., served as chairman. The discussion was initiated by Fred Keller, chief, and Walter G. Zelley, metallography division, Aluminum Research Laboratories, Aluminum Co. of America, New Kensington, Pa., in a contribution on "Plating on Aluminum."

The authors discussed in detail the most commonly used process for preparing aluminum for plating, the alkaline zinc immersion process, including effects of surface finishing, structure, and composition of the aluminum alloy.

"Cleaning, Acid Treatment and Chemical Brightening of Aluminum" was the subject considered by Walter R. Meyer, president and technical director, and Steven H. Brown, research chemist, Enthone Inc., New Haven, Conn. This paper covered precleaning, alkaline cleaning, etching, chemical polishing and brightening.

Phosphate Coatings for Aluminum—Alfred Douty, chief chemist, and F. Palin Spruance Jr., American Chemical Paint Co., Ambler, Pa., collaborated in a paper on "Amorphous Phosphate Coatings for Protection of Aluminum Alloys and for Paint Adhesion." They gave details of a new process for treating these alloys and characteristics of the coatings.

"Electroplating on Magnesium and Its Alloys" was the topic considered by Herbert K. DeLong, laboratory development division, Magnesium Laboratories, Dow Chemical Co., Midland, Mich. This paper furnished details of cleaning and pickling, final oxide removal and deposition of an adherent zinc film from a pyrophosphate-fluoride zinc dip, copper striking, plating (including barrel plating), as well as stripping methods.

Three papers were presented at the final educational session devoted to research. The session was presided over by Dr. Louis Weisberg, consultant, New York, and retiring chairman of the society's research committee. Following introduction of W. M. Tucker, Eastman Kodak Co., Rochester, N. Y. as the new chairman of the committee, Dr. John Kronsbein, professor and head of engineering, and Lester C. Morton, Evansville College, Evansville, Ind., presented "Distribution of Electrodeposited Metal on Some Simply Shaped Cathodes," a contribution from A.E.S. Research Project No. 11.

The authors used simple, nonmathematical language to describe the

HANDLING COSTS CUT: A 50 per cent reduction in handling costs is being effected in this structural and plate fabricating shop of Standard Iron & Steel Works, Toronto, Ontario, since erection, 1 year ago, of a Cleveland tramrail system and electric hoists. Tonnage output at the same time was increased by slightly over 100 per cent—attributed largely to the speed, flexibility and handling economy of the overhead handling equipment. The shop is located in a low-roofed side bay, which formerly was of little productive use

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Automobile-transport trailer under construction at Mechanical Handling Systems, Inc., Detroit, Mich. The J&L OTISCOLOY high-strength steel-sheet parts are easily formed and joined.

The high-strength steel trailer ready to get underway. Each automobile is safely cradled on OTISCOLOY sheet-steel tracks.

High-strength steel cuts ton-mile costs for operators of huge automobile transport trailers.

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J&L OTISCOLOY can be worked by any standard metal-working method . . . formed hot or cold . . . welded . . . flame-cut. Its ability to hold paint and resist corrosion further widens its applications.

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predictions from theoretical considerations as to how electrodeposited coatings that are distributed over cathodes that are of simple shapes under specified conditions that are ideal.

Porous Structure — "Outstanding Problems of Porous Structure in Electrodeposits," a contribution from A.E.S. Research Project No. 6, was presented by Dr. N. Thon, Frick Chemical Laboratory, Princeton University, Princeton, N. J. In this, the different types of porous structures found in electrodeposits and the factors associated with such structures were discussed. Nature of the metal, thickness of deposit, conditions of plating and condition of the surface on which the deposit is formed were considered.

"The Present Status of Plating Room Waste Disposal," a contribution from A.E.S. Research Report No. 10, was presented by Barnett F. Dodge, professor of chemical engineering, Sterling chemistry laboratory, Yale University, New Haven, Conn., and Fred C. Gurnham, professor of chemical engineering, Tufts College, Medford, Mass. This consisted of slides and descriptions of a number of plants for disposal of all kinds of plating waste.

Hydraulic Loading Devices Save Time and Labor

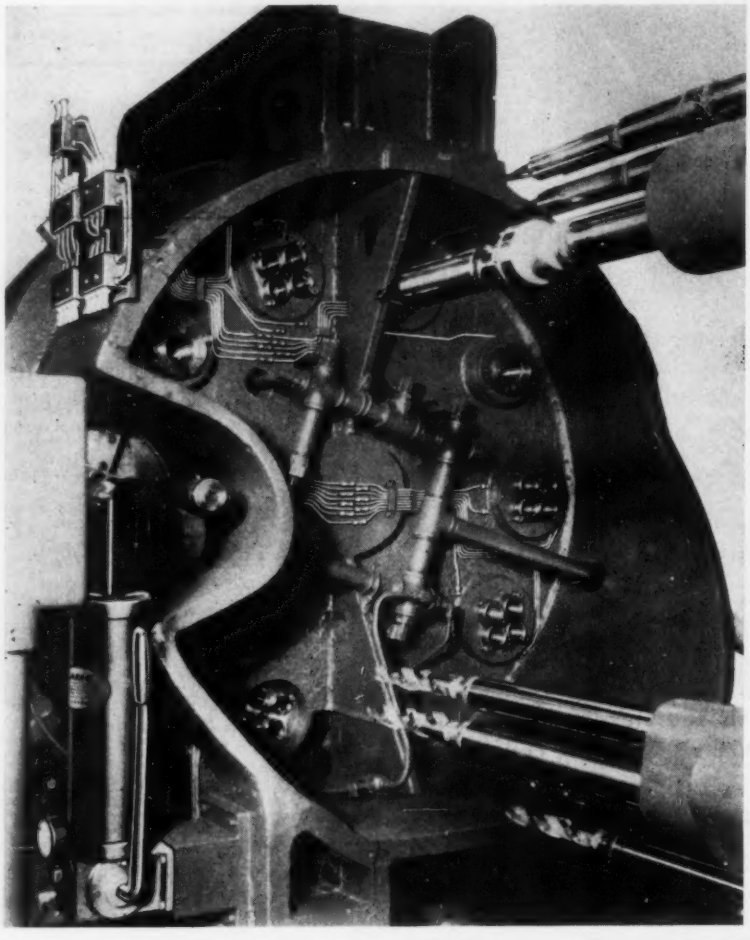
Loading and unloading time of trucks is considerably reduced with a recently perfected hydraulic loading device which, in effect, makes almost any truck self-loading. The device, developed by Stratton Equipment Co., Cleveland, and called the Hydro-Loader, not only lifts the load to the exact height desired, but carries the operator along with the load. Hydraulic mechanism of the loader is actuated from the power take-off on the truck transmission.

By finger tip control the operator raises or lowers the loader platform to the position desired, from the ground level to a height of 7 feet or over, depending on the model. When not in use, it lies flat against the side of the truck, adding only a few inches to the width, it is stated. Models with a lifting capacity of 750 and 1500 pounds are manufactured.

Functioning as a floor crane, truck loading crane and towing crane, is the 3-way Hydro-Crane, also announced by the company. The operating unit can be easily detached from the portable base on which it normally operates as a floor crane and be mounted on the bed of a truck in a heavy duty sleeve. In this position it is said to have a 360 degree turning radius to load the truck from either side or back. With the addition of two guide rods and a floating bar, the crane operates as a towing crane. Capacities of 1 and 2 tons are available. A beam extension is also offered which adds 3½ feet to the operating range.

—o—

Three technical papers presented at the 1948 Annual Meeting of the American Society for Testing Materials are included in the 40-page booklet, "Symposium on Usefulness and Limitations of Samples", published by American Society for Testing Materials, Philadelphia. Included in the booklet, offered at $1.00 per copy, are the following papers: Sampling and its uncertainties; on variations in materials, testing, and sample sizes; amount of inspection as a function of control of quality.



Lubrication Engineering

THIS close-up view of the special sliding bushing plate section of a horizontal, production indexing, drum type Barnes drill, is a good example of effective lubrication engineering. According to Farval Corp., Cleveland, it clearly indicates how a centralized lubricating system can be "engineered" to work efficiently in setups requiring periodic oiling, and how the maze of tubes involved can be skillfully arranged—not only to provide lubricant at all vital points, but also to prevent interference with "working tools" of the machine. All guide bushings shown here can be lubricated simultaneously in 1 minute with a few strokes of the manually-operated pump which can be seen at the lower left. Two lubricating systems—one on the drill head and another on the traveling carriage—service some 36 points of the machine which was designed for taper reaming nozzle holes of 5-inch rocket plates at rate of 100 per hour.

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- **High Speed—20 Kw. converter melts 30 lbs. of brass in 20 minutes, or 17 lbs. of steel in 29 minutes. Built also in 3, 6 and 40 kw. sizes. Generator operated units to 8 tons**

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Induction Heating

Ninety-Four Typewriter Parts Per Hour

IN a semiautomatic operation, 94 stamped key levers for electric typewriters are induction hardened in a minute by a Thermonic machine in the plant of International Business Machines Corp., Poughkeepsie, N. Y. The levers have an ear, the tip of which is hardened by the machine (Fig. 1), equipped with a special fixture fed from a magazine down which the stacked levers move by gravity.

At the bottom of the magazine, the ends of the ears to be heated move through a slot between two parts of the tubular copper heating coil as the stack feeds downward. Feed from the stack of levers depends upon a pair of circular disks on a horizontal shaft, motor driven at 94 rpm. On the same shaft is a pair of pickers which, at each revolution, pick off the key lever at the bottom of the stack. Timing and current flow are so adjusted that, by the time a lever reaches the pickoff, the tip of the ear to be hardened is up to the quenching temperature specified and the lever picked off falls into an oil quench tank below the fixture.

Once the magazine is loaded and machine is ready to run, the operator merely presses a button and the stack starts to move downward, continuing as long as the operator keeps the magazine loaded. Should the magazine become empty, current is shut off and the fixture stops until reloading is done and the start button is pressed again. Loading is done from the top of the magazine which is well above the heating coil. Besides being rapid, the machine insures a high degree of uniformity in hardening because heating is automatic and uniform.

Stampings Loaded on Belt

A similar operation is performed on another machine of the same make (Fig. 2), but equipped with a belt carrying blocks having slots in which stampings are set on edge. The belt then advances the tip of the stamping through a slot between two legs of an induction coil which heats the end to quenching temperature during the traverse of the slot, after which the parts are ejected into a quench.

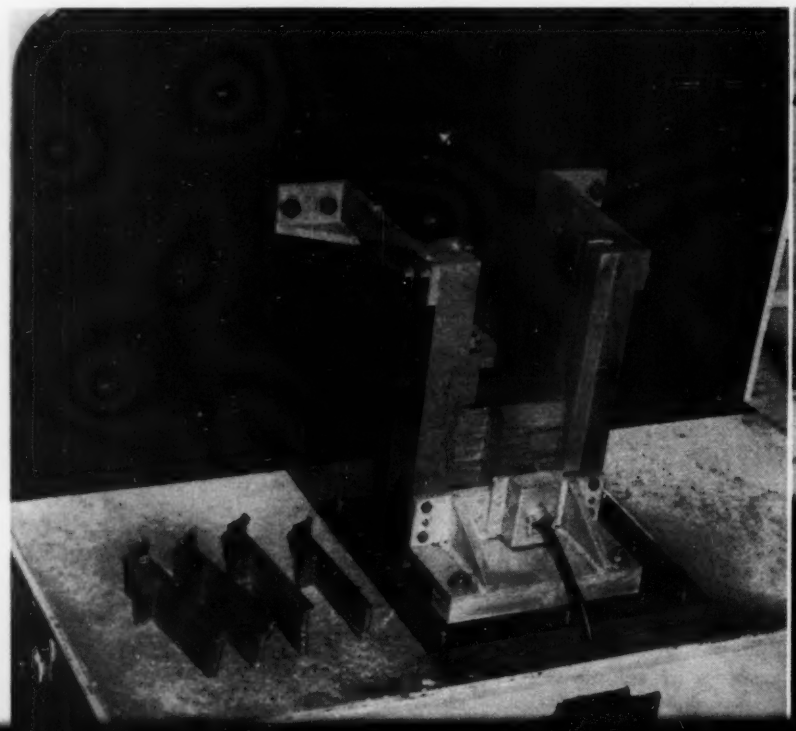
In this setup the coil is supported in a trunnioned bracket which can be raised or lowered to adapt the machine to pieces of different lengths. Belt speed can also be varied to suit the piece of the part thereof to be heat treated.

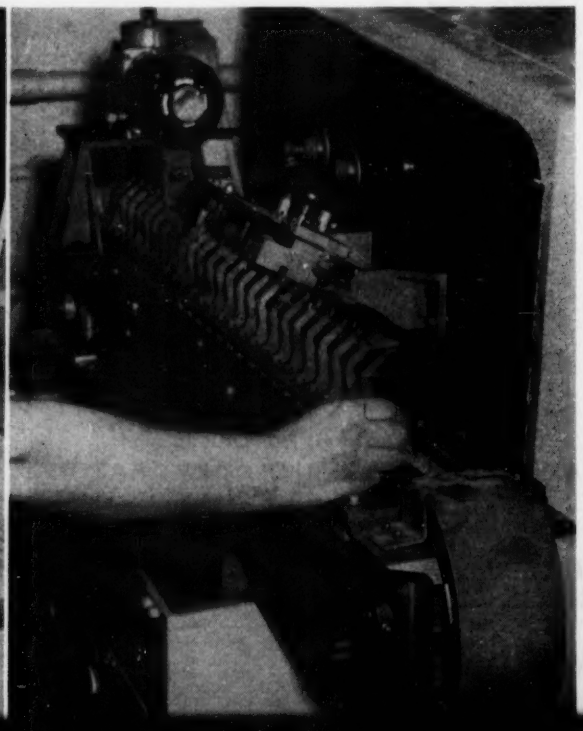
It is necessary, of course, that the work does not touch the coil, as it might do if not properly loaded. This is prevented by providing a gate having a slot through which the tip of the piece will pass if properly loaded. If positioning is not correct, the tip will strike the hinged gate, deflecting it enough to break a circuit, thereby stopping the belt and de-energizing the heating coil. This warns the operator, who has to remove the improperly loaded piece from the belt before the machine will start operating again.

As this second machine depends upon hand loading each piece separately, it is not as fast as the first machine in which several pieces are loaded at once in the magazine. On the other hand, the belt arrangement is quickly adapted to handle several different designs of parts which, if adapted to the first machine, would require a magazine to fit each different design.

Fig. 1 (left)—Thermonic induction heating machine showing how stampings are advanced by gravity through a slot between legs of heating coil. At bottom of magazine a device picks bottom stamping off the stack and drops it in the quench below

Fig. 2—(right)—In this machine, parts are loaded by hand on belt that advances them to heating coil which is adjustable for parts of different length and shape





Power Hand Truck Movie Shows Applications

Showing how the Worksaver powered hand truck, made by Yale & Towne Mfg. Co., Philadelphia, Pa., is used to save dollars, physical exertion, time and floor space is the subject of a new 15-minute 16 mm sound-color movie, "Here's Your Worksaver", available from the company. Actual applications are demonstrated in the plants of companies in several fields.

Typical examples of handling skid bins, drums, and boxes are shown as they apply in chemical, steel, glass, aluminum and other industries. Seven basic models of the industrial truck are pictured.

Circuit Breaker Ratings Approved by ASA

Preferred ratings for power circuit breakers are contained in recently approved tables issued by American Standard Association, New York, N. Y. Standard, designated as C37.6-1949, was developed by a committee of manufacturers, users and engineers interested in power switch-gear under the procedure of the American Standards Association. It is said to meet all usual needs of circuit breaker users and at the same time gives both manufacturers and users the benefits of standardization.

Schedules are presented in four tables of ratings covering circuit breakers of the following types: Indoor oil, indoor oilless, outdoor oil and outdoor oilless and low oil content. This 1949 revision has a reduction in the number of individual ratings in each classification, resulting in a net reduction of 43 ratings from 121 in 1945 schedules to 78 in the present edition.

Huge Marine Bull Gears

MACHINED TO CLOSE TOLERANCES

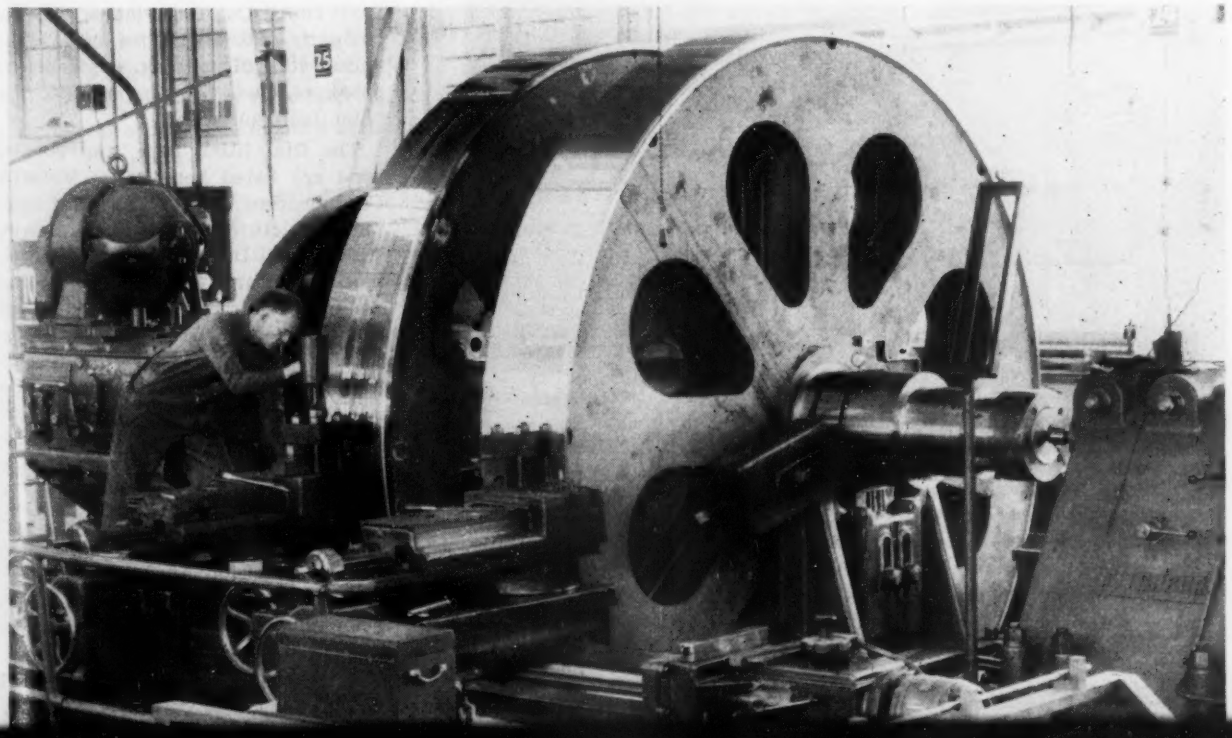
BEING the biggest and heaviest single unit of machinery and about the most microscopically accurate thing aboard is the dual distinction held by the bull gear in a modern turbine-driven ship. Although the weight of the two bull gears and shaft shown being machined at the Sunnyvale, Calif. plant of Westinghouse Electric Corp. is 51,200 pounds, tolerances for this operation must be held to as close as 0.0003-inch. The two wheels are welded together on a shaft to form the final stage of a gear train that reduces the 6000 rpm of a 7500 hp turbine to approximately 100 rpm for the propeller drive. Diameter of each bull-gear wheel is 146.392 inches.

Each of the two bull-gear wheels has opposite helixes, containing 693 teeth with a diametral pitch of five. The two helixes must intersect at a hypothetical line exactly midway between the two inner rims. Hubs of the gear are forged steel, sides are of steel plate and the rims and shaft are high-carbon-steel forgings.

Big lathe shown in the illustration turns the wheels in four major operations: For the wheel diameters, faces of rims, beveled corners, and wheel shoulders or dowels. For any of these surfaces the maximum "indicator runout" or the amount that dimensions may vary from the computed figures is said to be less than three ten-thousandths of an inch. Care is taken to make sure that the big wheels and their shaft are properly aligned before machining.

Prior to the machining, the wheel is completely welded, normalized and shrunk on its shaft. Hobbing of the teeth is done by a rotary multi-pointed tool not unlike a pine cone in appearance. It takes 12 minutes for the wheel to revolve and with each revolution the hob advances into fresh metal. Both a rough cut and a finish cut are made for each wheel. A rough cut takes about 90 hours per wheel; a finish cut, 120 hours. The hobbing room and lubricating oil are kept at a constant temperature of 78° to 80° F to limit temperature changes in the wheel during the operation that would affect accuracy.

Operations performed on 142-inch marine bull gears by this lathe include machining wheel diameters, faces of rims and wheel shoulders or dowels and beveling corners



Expansion Program

(*Concluded from Page* 107)

A new sheet galvanizing line has been installed which is capable of coating material up to 52 x 160 inches maximum. The line has a capacity of 14.5 tons of galvanized product hourly.

Three alkaline-type electrolytic tinning lines are in operation at the present time, in addition to six separate continuous units used for brightening the plated tin. The tinning lines operate at speeds of 450 to 900 fpm. Each plating line will average approximately 20 tons production hourly, handling coils that average around 10,000 pounds in weight.

Changes In Tin Plate Dept.—In the tin plate department, a single stand skin pass mill was converted to a 2-stand tandem unit affording delivery speeds up to 3675 fpm. The first stand has forged steel work rolls, 12 x 42 inches and cast alloy steel back-up rolls 53 x 42 inches. The second stand has 19 x 42-inch work rolls and 49 x 42-inch back-up rolls. This twin stand mill is unique in that the back-up rolls of the first stand are driven by two 300 hp, 200 to 300 rpm, 600 v dc motors in a twin drive arrangement. On the second stand, the work rolls are each driven by two 200 hp, 575-750 rpm, 300 v dc motors arranged in a direct double motor twin drive. Power for the motors of the skin-pass mill is secured from a 1750 kw, 600-v generator driven by a 2500 hp, 6600-v motor. The unit is rated an average hourly output of 41 tons.

Nine years ago the company installed two continuous butt weld pipe mills, one of which produces pipe ½ to 1¼ inches in diameter, while the other delivers diameters of 1½ to 4 inches. Both consist of an uncoiler, leveler, shear, flashwelder and trimmer, pinch roll, looping bed, furnace, forming mill, hot saw, runout table and cooling bed. Production from the smaller mill averages approximately 15½ tons hourly, while production from the larger mill averages approximately 27 tons per hour. At the time of installation, two old-style butt-weld mills were removed, however, two lap-weld mills are still in operation and produce a product 3½ to 16 inches in diameter.

To increase the rod and wire production, No. 1 rod mill, which was built some 23 years ago, was converted from a two-strand to a three-strand unit. The mill has seven 12-inch roughing stands and ten 10-inch finishing stands all in line and driven through gearing by a single 4000 hp, 6600-v, 375 rpm, 25-cycle motor. This unit produces rods from No. 5 to ½-inch in diameter at a speed of 3489 fpm. It averages 32.5 tons per hour. On the No. 2 rod mill, the installation of a second finishing train has enabled increased production. Originally, the unit consisted of nine roughing stands, four intermediate stands, two looping stands, and six 10-inch finishing stands. The new addition of a second finishing train duplicates the original stands Nos. 15, 16, 17, 18, 19 and 20, and has increased production of No. 5 rod from 25 to 45 tons per hour, with 60 to 70 tons hourly increase being secured on larger size rods.

Bar production has also been increased from 25 to 70 tons hourly depending upon the size being rolled. Wire and rod finishing equipment at Sparrows Point, now includes 59 continuous wire drawing machines and 66 single or double-decked blocks which process approximately 35,000 tons of product per month. Three flash baker lines are in operation in addition to another bethanizing unit which imparts a heavy durable coating of pure zinc in a continuous electrolytic process which is a development of the engineers at Bethlehem.

Increased heating capacities in the various mills are enabling the operators to turn out better products at lower cost. These facilities were installed at the 40-inch slabbing mill and the 56-inch hot strip mill. Four rows of soaking pits have been added to heat ingots for subsequent rolling in the 40-inch blooming mill.

IT "LISTENS" CLOSELY: Supersonic testing of tool steel billets and large bars, the subject of 4 years of investigation by Bethlehem Steel Co., now is being used to reveal the presence and location of voids, pipe, flakes, cracks and other internal defects. Inaudible sound waves of frequencies ranging from 1 to 5 million cycles per second are employed

Company Offers Films For Industrial Audiences

Available for showing at engineering society meetings, schools and industrial plants on a free loan basis are eight motion picture and sound slide films. These films, on the subjects listed below, may be obtained from DoAll Co., Des Plaines, Ill. The company states that for large audiences, it will furnish engineers as speakers and to demonstrate machine tool equipment.

The film titles, type, and running time are listed here: "The Versatile Contour Saw," color, 16 mm sound motion picture, 48 minutes; "Sawing An Internal Irregular Shape," 16 mm motion picture, 30 minutes; "Filing An Internal Irregular Shape," 16 mm motion picture, 25 minutes; "Gage Blocks and Accessories," 16 mm sound motion picture, 25 minutes; "How DoAll Gages Are Made," 35 mm sound-slide film 7 minutes; "Theory Behind The Use Of DoAll Gages," 35 mm sound-slide film, 26 minutes; "How DoAll Gages Are Used," 35 mm sound-slide film, 18 minutes; "DoAll Precision Accuracy With The DoAll Inspection Laboratory," 35 mm sound-slide film, 28 minutes.

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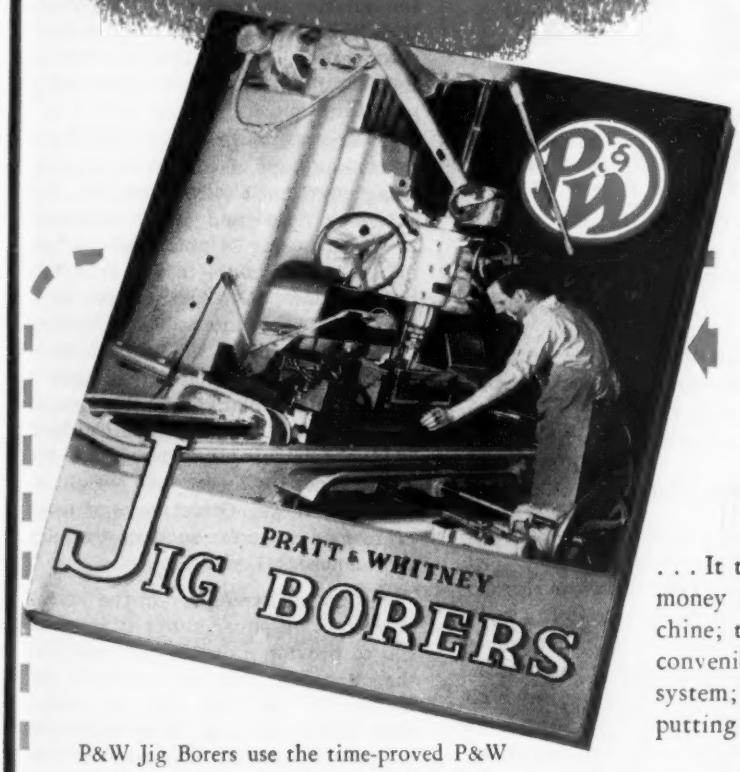
ON THE P&W
JIG BORER



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JIG BORERS

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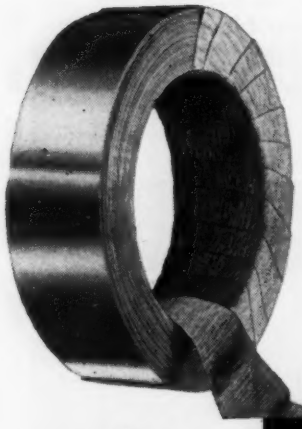

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Induction Brazing

(*Continued from Page 84*)

surface of the parts to be brazed.

Variety of Joints—In Fig. 4 may be seen a variety of silver brazed joints, representative of the assemblies suited to induction heat. For the tubular assembly at A, an alloy ring is placed on the inside when heat is applied to the joint the alloy flows throughout the shear area. The assembly at B is similar, although the ring is placed into a groove cut in the insert. This means of preplacing rings assures the alloy remaining in place until it melts, then it leaves the groove and flows in both directions throughout the joint. The three examples at C show different methods for joining a pin and a collar, using preformed rings.

Covers can be brazed to containers in various ways, as shown at D and E, using preformed wire rings. At F is shown a tube and insert assembly in which a ring is placed into a machined groove of the insert; from this point it flows to the joint faces when heated. Other methods of making such an assembly are shown at G and H. The example at K uses a shim of alloy, blanked in the form of a washer and placed under the head of the bushing. When heated, the bushing settles by its own weight as the alloy flows. Other ways of using preformed rings for such an assembly are shown at L and M.

Design for Strength—In the joining of metals by silver alloys it is essential to provide a design that will give the strength that is required, and preferably one that can be assembled easily, as has been previously mentioned. Next, accuracy of the parts should be held to close enough tolerances so that a predetermined amount of silver alloy will fill the joint area. As in the joining of metals by any means, it is essential that the parts are exceptionally clean, and free from any form of film, dirt, oil, oxide or other impurities. More failures in joining can be attributed to unclean surfaces than to any other source.

Cleaning can be carried out by mechanical means, such as wire brushing or sandblasting, or by means of chemicals, as may be best suited. Brazing should be completed as soon after cleaning as possible, because normal re-oxidation takes place if metal parts stand around too long.

Flux of the boric acid type is necessary to provide a proper flow of the alloy to the surfaces to be joined. Usually, flux is applied with a brush, or the work is dipped if more con-

vent. The flux protects the metal against oxidation, during the heating cycle, and should be applied soon after cleaning. The flux should have a low melting point and be entirely liquid before the silver alloy melts. Removal of the flux after brazing can be accomplished by dipping the assembly in hot water before it has cooled.

Application of Flux—Flux may be applied immediately before an assembly is heated. Even though it is liquid the moisture evaporates quickly as heating takes place. Flux may also be applied sometimes prior to brazing, in which case it dries out in a few minutes to a white, chalky coating. There is little difference in the action of the flux whether it is wet or dry. There is, however, a limit to the length of time flux can remain on a surface before brazing is completed. Standing more than 12 hours, it is apt to become acid or sour, and to lose its effectiveness. An extremely moist assembly requires slightly more energy than a dry one because some power is used for evaporation. The difference is small and generally need not be taken into consideration.

Functions of a flux include dissolving of oxides formed as the parts and the silver alloy are heated; shielding the brazing alloy from oxidation; promoting the flow of the alloy by capillary; and insuring clean surfaces for spreading the brazing alloy. The flux should adhere to the brazed surfaces in a thin layer, and should be fluid enough to be distributed uniformly during heating within a differential of 50 to 100° F.

An important consideration in induction brazing is to have sufficient power output of the high-frequency generator to produce the temperature rise to the mass being heated within a given time interval. The available power will determine whether one or more assemblies can be heated simultaneously, and of course, whether there is enough power to heat even a single piece fast enough to meet production needs. High frequency oscillators are available with power outputs from 1 to 50 kw, or more, but for the average brazing setups, units of 5 to 25 kw output are most common. The simplest means of determining the rate of heating is by the formula:

W x SH x TR = Btu's required
(56.7 Btu = 1 kw)

Where W = Weight of material to be heated,
SH = Specific heat of material and,
TR = Temperature rise required.

"WISE ECONOMY RESULTS FROM WISE SELECTION OF CUTTING FLUIDS"

THE case studies listed below of benefits derived from the soundly engineered application of D. A. Stuart cutting fluids will unquestionably appeal to cost-conscious management and production men. These reports are typical of those received daily.

An Eastern firm operates a special threading machine for simultaneously threading three BX connectors drawn from SAE 1010 sheet. Running at 68 S.F.M., finish was unsatisfactory. A change to D. A. Stuart THREDKUT produced a satisfactory finish and increased production. In addition, die life was increased 3 to 4 hours.

A rifle manufacturer crush dress grinding 8640 roll hardened (Rockwell C40) bolts was obtaining 15-20 pieces between dressings and crushing roll performance was poor. Selection of D. A. Stuart SUPERKOOL 81-X gave them over 300 pieces from one wheel dressing.

It is significant that in both of the above cases, selection of a cutting fluid was made on a basis of *performance,* rather than price or opinion.

Ask to have a D. A. Stuart representative show you how wise selection of cutting fluids can lower your costs.

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Uniform Heating — In heating an assembly to be silver brazed, it is important that all surfaces are heated uniformly and that they reach the desired temperature simultaneously, or within the shortest interval of time possible. If the parts to be brazed are of unequal mass, the method of heating should be such as to concentrate maximum energy to the heavier section and to avoid overheating of lighter sections, which may have harmful effects on the silver alloy, or promote contamination as a result of scaling.

When designing coils for brazing, it is necessary to determine where the current will flow in the work in relation to the overall shape and size of the coil itself. High-frequency current travels on the inside surface of a coil, and follows the path of least impedance, forming continuous loops within the coil. Metal parts placed within a coil, therefore, enter an intense field and become heated quickly. Parts placed on the outside of a coil would heat slowly, and probably not at all if induced loops were not transferred to the surface of the piece being treated. This phenomenon is important and should be analyzed with each coil, especially those of varied shapes, or of built-up construction.

Shapes of Work Coils—Work coils for brazing can be made in a wide variety of shapes and forms, some of the most common designs being illustrated in Fig. 6. The single turn coil A, is broadly used because of its ability to generate heat to a narrow band, as is often required for metal assemblies. Its use, however, is limited to ferrous materials. Multiturn coils, as at B, are used where a wider heat area is needed, and always for nonferrous metal assemblies which require high impedance coils in order to circulate ample current in the work. These single and multiturn coils, made from copper tubing, can be arranged in series for multiple brazing setups, shown at C.

When a more rugged single turn coil is wanted, either single or multiple positions, it can be made from copper plate, with thicknesses of ¼ to 1 inch, or more, as shown at D and E. Suitable holes are drilled around the openings for the continous passage of water for cooling. Conveyor type coils, as the one shown at F, through which metal assemblies feed progressively, also find broad uses. They can be made with either single or multiturns, depending upon the nature of the work. As a rule, they are limited to small assemblies, and it is sometimes necessary to rotate the work to assure proper heating. Coil designs, as shown, have many modifications and combinations and there seem to be endless ways of winding and forming them to meet specific needs.

Multiposition Setup — A typical multiposition setup for brazing a section of steel tubing to a screw-machine insert is illustrated in Fig. 7. Eight assemblies are handled simultaneously by a solid-type single turn coil. The coil is attached to a nonmetallic fixture plate, on which locating studs are mounted for location of the work. A section through one of the stations is shown at the left. The screw-machine insert is grooved to receive a preformed alloy ring. The parts are fluxed, fitted together, then heated. Using a 20 kw generator, the eight assemblies are brazed in 35 seconds.

In Fig. 5 is shown an induction brazing installation, in which five assemblies are placed on a Transite fixture plate, which in turn is loaded into the workcoil. The bench operators flux, assemble, load and unload the fixtures, and inspect the brazed assemblies.

Induction brazing with silver alloys offers many advantages and economies in fabricating metal assemblies. Its uses are widespread and its techniques are quickly acquired. Basically, parts to be brazed should be machined to normal accuracy, so that they fit together properly. Suitable cleaning methods are essential; then it only remains to provide a workcoil and a means of holding the work in or feeding it through the coil to obtain precise and uniform results.

Operating Efficiency

(*Continued from Page* 88)

the operator with the volume control knob turned to the low position. This volume control knob is mounted on each speaker and can be set to suit the hearing of each individual operator. In this case, the operator has a crane on either side of him on the runway. Because he hears over his loud speaker the instructions given to the other cranes, he knows where they will want to move and what they are going to do. This, it can be pointed out, eliminates the one subconscious worry of all crane operators as to whether they are about to collide with another crane.

Ore Bridges—South Works of Carnegie-Illinois Steel Corp., South Chicago, Ill., has a trolleyphone installation on ore bridges and transfer cars. The foreman of the Hi-Line office can direct the operators of the ore bridges and transfer cars, each of which is equipped with a phone. The transfer cars are of more immediate concern to him than the bridges as he must keep cars moving continuously to feed a row of blast furnaces.

To get whatever type of ore is required, the transfer cars communicate with the ore bridges. Frequently the foreman will call bridge No. 2 or No. 3 and specify that they deliver a load of a particular type of ore to a certain transfer car. He then asks for confirmation of this order from both the transfer car and bridge and when he receives this confirmation he knows there can be no misunderstanding.

This particular dock is almost ¾-mile long. Before trolleyphones were installed, a considerable amount of the foreman's time was spent in going back and forth giving orders to the bridges and to the transfer cars. At night and in extremely bad weather, it was almost impossible to get this information delivered.

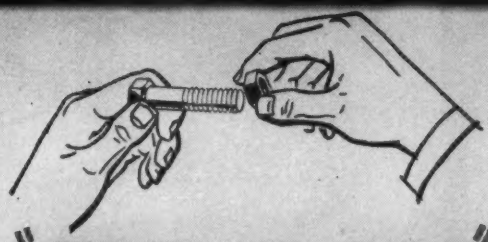
Safety Features — Another most important advantage of phone communication at South Works is the safety feature. It is far less dangerous to call the bridge operator by trolleyphone than it is to tread one's way along icy walkways and up frozen ladders to transmit messages.

Each bridge operator is at all times in direct communication with the dock office, the Hi-Line office, the transfer cars and the other ore bridges. Here again the operator can work more efficiently now that he does not have to be concerned with watching or listening for outside instruction signals of any kind. All instructions are sent to him by trolleyphone. Furthermore, any troubles which develop he reports to the Hi-Line office.

Another application for trolleyphones in use in several eastern steel plants is in providing communication between the pusher of a coke oven battery and the hot car. This contact prevents mixup as to which oven is to be pushed and it also enables the hot car operator to tell the pusher to stop if some trouble develops. This type of installation was made in one plant because with numerous boats whistling in the river it was difficult to tell just when the hot cars whistled for a push. In another plant, hot cars are equipped with phones to prevent the cars running into one another.

Extension Units — It is to be recalled that mention was made earlier

"A BOLT IS ONLY **HALF** A **FASTENER** WITHOUT A NUT!"



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TAPPING SCREWS	ROPE CLIPS	SET SCREWS	PLOW BOLTS
"1035" CAP SCREWS	MACHINE BOLTS	CARRIAGE BOLTS	COTTER PINS

—CUT ALONG THIS LINE—

WANT MORE INFORMATION on any of these fasteners? **CHECK**—and **CLIP** this strip.

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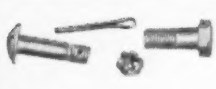

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"1035" CAP SCREWS: Hi-Tensile heat-treated steel.

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Keystone's new Galvanized MB Wire offers improved corrosion resistance. It gives added life and strength to mechanical springs subject to rust and corrosion. This is due to Keystone's unique method of galvanizing the wire **before** it is cold-drawn. The drawing process smooths and hardens the galvanized finish, increasing its lasting qualities remarkably. Other advantages are its lustre-bright, shiny smooth finish . . . even, uniform temper . . . and high tensile strength.

Whatever your industrial wire problem might be, Keystone's wire specialists can help solve them for you.

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of the use of extension units, specifically in the case of soaking pit bottom makers being provided with extensions connected through the steel recorder's office to assist them in calling for a crane. Frequently it becomes desirable to locate such extension units at various points near the ground station. These units are less expensive than the complete trolleyphone, but they must be connected permanently to the one ground phone by means of four wires. Each extension unit includes a microphone, a loud speaker and a relay box. The relay permits a floorman to talk over the extension unit to all other points equipped with trolleyphones or with other extension units.

Generally speaking, it is necessary only to hook the trolleyphone to the direct-current power line at a point where the phone is desired. Any other trolleyphone that is hooked into the same circuit will talk with this first phone. No extra wire is required as the high-frequency carrier wave travels through the existing power lines.

Unlike telephones, which are installed at fixed points, this system provides instant and continuous contact between stations irrespective of whether the stations are fixed or moving. It is a common talking system. Each station is equipped with a press-to-talk microphone and words spoken into any one microphone come out of all other speakers. Calling is done by simply speaking the name or number of the party wanted. An indefinite number of systems may be used on any installation and all units will hear regardless of position as long as they are in contact with the source of power, and their talk buttons are not held in a talk position.

The same kind of equipment is used for stationary or moving positions. It consists of a transreceiver unit which is both transmitter and receiver, a resistor for lowering the line voltage enough to operate the tube heaters, a speaker and a microphone. Shock-mounted in a heavy steel case, the equipment weighs about 80 pounds.

Power for the Unit — Power for operating the unit is taken from the power line, one wire being connected to the hot side of the line where it is continuously energized from the trolley or cable line and the other wire is connected to the ground. The 250 or 550 v direct current supplies the plate voltage for the tubes and also the heater current. Units also can be supplied to operate on 110 and 220 v alternating current, single or three phase. Current drain is about 1 amp and

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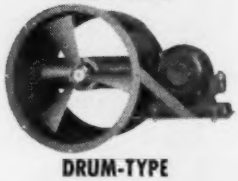
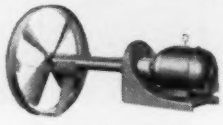


DRUM-TYPE FOR DUCTS AND STACKS



EXTENDED SHAFT PROTECTS MOTOR

DRUMLESS FOR DUCTS AND STACKS

DIRECT-CONNECTED; MANY USES

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DIVISION OF ROBBINS & MYERS • INC.

SPRINGFIELD 98 OHIO

the system is designed to operate within the usual fluctuations in line voltage.

The system operates through use of a frequency modulated carrier current in the range of 100 kc which is below the radio broadcast band but considerably above the audible voice range. Signal output of a transmitter is about 50 w. Frequency modulation provides automatic control of speaker volume and the speaker is as loud when it is 3 miles from the transmitter as when it is adjacent to the latter. When the unit quits talking it is because the signal level has dropped down below the noise level, and in this case it simply shuts off.

Squelch Circuit Developed—A special squelch circuit developed for the equipment keeps noise from coming out of any speaker until the receiver is engaged by someone operating a microphone button. This keeps the usual rasping and humming noises out of the speaker. Another feature is that noise, no matter how loud, cannot blast through at a level above that of the voice. Conversation can be held any time a set is connected to the power source; in the case of moving installations whenever there is power through the trolley and rail circuit is continuous. The frequency modulation system actually will talk through a sustained arc.

The transreceiver is mounted in rubber so the equipment cannot be damaged by vibration or shock. All tubes, of which there are 14, are of standard radio type. Plug-in construction is used throughout for ease in servicing, and should a unit fail to work, it can be replaced speedily with spare equipment. Each unit has three plug connections, one to the power supply, one to the microphone and one to the speaker. Thus, new microphones, or speakers can be tried by simply plugging them in. Anyone qualified in radio can service the transreceiver without difficulty.

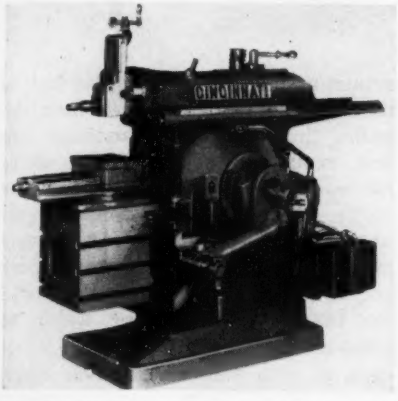
—o—

Electrical contacts made from copper tungsten by the powder metallurgy process are being manufactured by Gibson Electric Co., Pittsburgh, for the interruption of very heavy currents with minimum erosion. Typical applications for the Gibsiloy UW6 contacts are in air circuit breaker arcing tips and intermediate contacts, oil circuit breaker arcing tips and current carrying contacts and oil immersed contactor contacts. The material has a hardness of 90 Rockwell B and a cross breaking strength of 135,000 psi.

New Products and Equipment

Shaper

Table of the utility shaper, made by Cincinnati Shaper Co., Cincinnati 25, O., is supported directly on cross rails without an apron and is heavy enough to take a full load without table support. This construction adds to the rigidity of the table by reducing overhang. The new models are equipped with higher



speeds for the use of carbide tools. Cutting speeds of over 250 fpm are possible on a 10-inch stroke.

Other features include automatic lubrication to all bearings including the table bearing on the rail, single point taper gib adjustment improved rail lock that operates from the operator's position. An improved tool lifter, power down feed to the head and rapid power traverse to the rail are offered. Machines are made in 16 and 20-inch stroke sizes and can be equipped with a 3 or 5 hp motor drive.

Check No. 1 on Reply Card for more Details

Roll Forming Machine

Roll forming machines which form, curve, emboss and cut in one continuous operation are built in standard sizes to take material up to 15 inches wide and ⅛-inch thick by American Roller Die Corp., 20500 St. Clair Ave., Cleveland 17, O. Larger sizes for material up to 50 inches wide and ⅜-inch thick may be supplied. Molding, beading, metal roofing, automotive parts, tubing, weather stripping and various other shapes may be formed on the machine.

Type F machines for material up to 15 inches wide have 2 to 20 spindles. Speed in feet per minute varies from 100 to 200 on the smallest machine to 75 to 150 on the largest. Machine bases are of welded steel and the houses are of semisteel castings. Should future work require additional units, it is not necessary to purchase an entire new machine; unit-built design permits purchase of any length bed and incorporating of additional units at any time. Antifriction bearings, either roller or ball, are standard.

Check No. 2 on Reply Card for more Details

Cylindrical Grinder

Designated by the name Grindwell, a general purpose cylindrical grinding machine offered by Landis Tool Co., Waynesboro, Pa., can be used for small lot manufacturing purposes in large or small shops, tool rooms and for training purposes. It has a capacity of 28 inches between centers and will swing 12-inch diameter work. Grinding wheel base is equipped with a 12-inch diameter grinding wheel powered by a 1 hp

motor. Self-aligning, babbitt lined, one piece steel Microsphere bearings, used to support the wheel spindle, will absorb thrust load.

A graduated swivel base permits swiveling the wheel head for unusual grinding setups or for truing an angle on the wheel face. Infinite headstock speed range is from 85 to 483 rpm. The only revolving parts are the motor spindle and face plate. Either live or dead spindle operations may be used by moving a lever. Four different speeds may be selected for power traverse. Two-speed hand traverse is standard. A reservoir for coolant with settling baffles and sloping cleanout lip are part of the normalized base castings.

Check No. 3 on Reply Card for more Details

Conveyor Belt

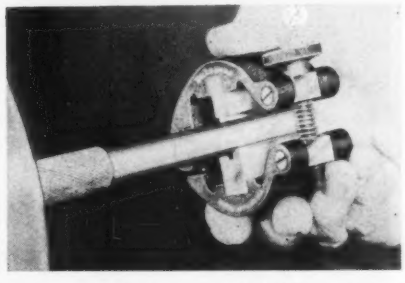
Molded with a corrugated surface, a new type of conveyor belt announced by Russell Mfg. Co., Middletown, Conn., will raise light loads in cartons or heavy materials in bags up inclines of 30 to 40 degrees. Called Ruff-Ridge, it consists of a solid woven carcass thoroughly impregnated with a Neoprene solvent cement for moisture resistance. It is then coated on the upper side with a layer of a Neoprene-natural rubber blend 1/8 to 3/16-inch thick.

Corrugations are approximately 3/32-inch deep on 5/16-inch centers. Individual corrugations are designed in shape and strength for maximum traction. Flexing the belt around the pulleys generally prevents the accumulation of dirt but the corrugations may be brushed out if necessary. Belting is made in 250 foot rolls, in several thicknesses and in standard widths up to 24 inches.

Check No. 4 on Reply Card for more Details

External Hone

Precision external diameters may be produced and ovality corrected and taper removed with an external hone manufactured by Delapena & Son Ltd., Cheltenham, England, sold in United States by Motch & Merryweather Machinery Co., 715 Penton Bldg., Cleveland 13, O. Hone consists of a body member into which is fitted one of a series of guide blocks, together with stone holders to suit the diameter of the work to be honed. Body member consists of two hinged parts which are held apart by a



spring against an adjustable stop or control screw.

Three types of stones are supplied for honing of work—roughing, finishing and polishing stones. They are mounted on holders which fit in the hone body. A truing stick insures proper stone alignment with respect to guide blocks. Hones are made for diameters between 1/16 and 1-inch.

Check No. 5 on Reply Card for more Details

AC Arc Welders

Increased welding range and stepless precision current control are featured in a new line of alternating current arc welders developed by Welding Division of General Electric Co., Schenectady 5, N. Y. Welders are offered in 200, 300 and 400 and 500-amp models for indoor manual welding; 750 and 1000 amp models

for machine and submerged welding; and a special 200-amp model for light-duty, job shop welding. The 300, 400 and 500-amp models are also offered with weather-resistant enclosures with Idlematic control for both indoor and outdoor operation.

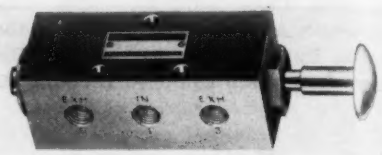
Dual current ranges and increased adjustment overtravel on the new machines provide extra low current range with high maximum short time output. Welders have an open-circuit voltage of 75 v. Idlematic controls automatically reduce open circuit voltage on the electrode to about 30 v, but when the arc is struck the advantage of 75 v open-circuit voltage is retained.

Check No. 6 on Reply Card for more Details

Control Valves

Featuring simplicity in design and ease of operation, a line of small single plunger valves, made by C. B. Hunt & Son Inc., Salem, O., are suited for use with manually controlled presses, pilot circuits and in other processing cycles when frequent manual operation is required. Known as series O and OE valves, they consist of an aluminum housing, a hollow stainless steel plunger with precision placed ports, brass spacers accurately positioned end to end on each other, O-ring packers and closing brass gland nuts and an aluminum pushbutton.

Valves are balanced and will remain in position until changed. A spring can be mounted when spring

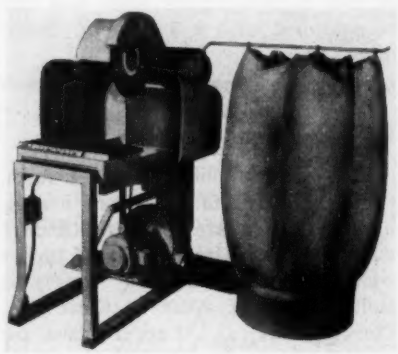


return action is desired. The flow is through the plunger and around the seals, thus prolonging packing life and reducing repairs and maintenance. They are offered for either ⅛ or ¼-inch pipe connection in 2-way, 3-way open exhaust, 3-way piped exhaust, double 2-way, 4-way and 5-way designs. They are suited for use with air, oil or water at pressures up to 125 psi.

Check No. 7 on Reply Card for more Details

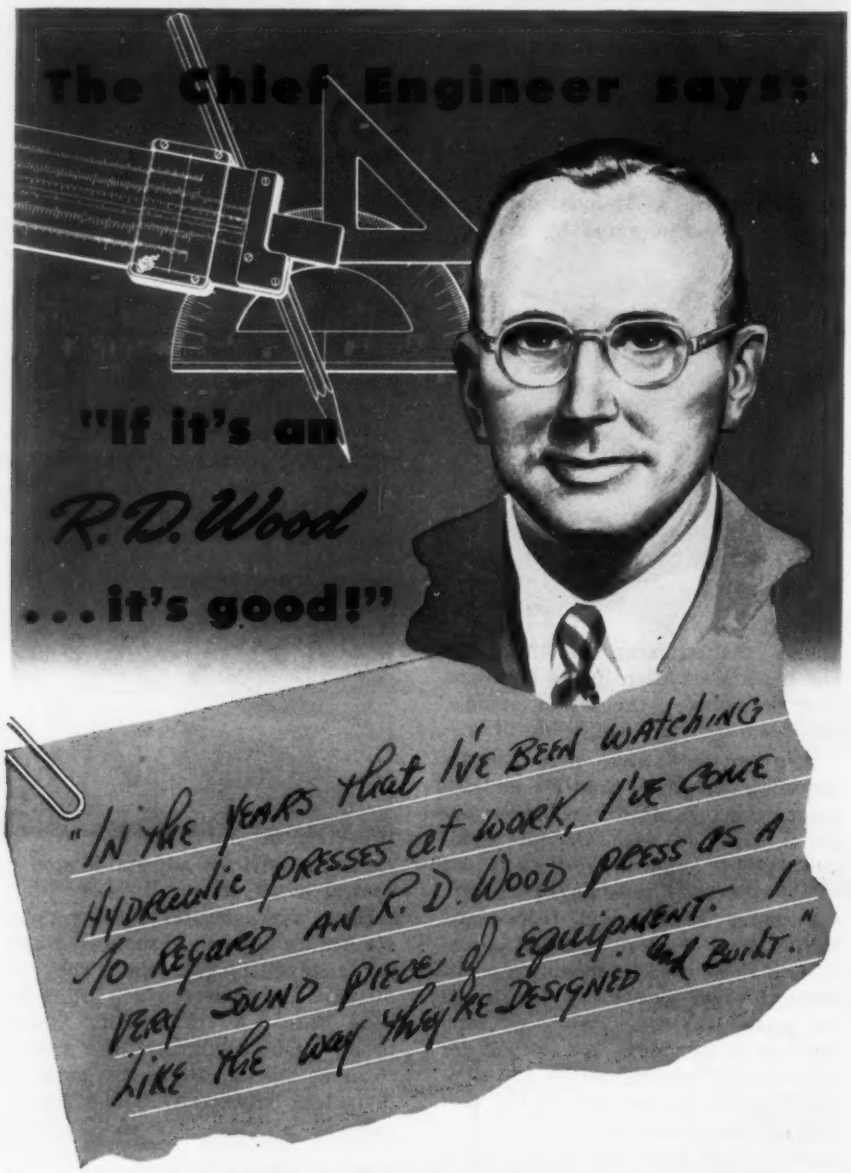
Masonry Saws

All working parts of the blade assembly function as a single unit on the Fireproofer masonry saws developed by Martin Fireproofing Corp., 2200 Military Rd., Buffalo 17, N. Y. This feature increases rigidity, eliminates points of wear and decreases vibration. The cutting table is adjusted for material of various thick-



nesses by lifting and locking in place. A fingertip control release easily lowers the table. Frame is of angle iron and protective shielding of heavy gage sheet steel.

Four models of the saw are portable and may be moved through any average doorway. Model ADF is a dry cutting saw with built-in dust collector. Model WF features wet or dry cutting, utilizing a self-priming pump with four water jets spraying against the blade. Model F-14 dry


The Chief Engineer says:
"If it's an
R.D. Wood
...it's good!"
"In the years that I've been watching Hydraulic presses at work, I've come to regard an R.D. Wood press as a very sound piece of equipment. I like the way they're designed and built."

Write for information and data sheets on hydraulic presses, or consult us without obligation on *any* hydraulic problem.

HYDRAULIC PRESSES AND VALVES FOR [illegible] • INTENSIFIERS

EST. 1803

R.D. Wood Company

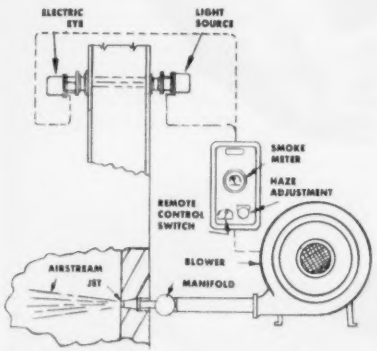
PUBLIC LEDGER BUILDING, PHILADELPHIA 6, PA.

cutting saw has no means of dust suppression. Model F-12 has a smaller cutting capacity than model F-14.

Check No. 8 on Reply Card for more Details

Air Jet System

In order to bring about complete fuel combustion within the fire box, and subsequently control smoke, Eclipse Fuel Engineering Co., Rockford, Ill., is producing an overfired air jet system. When used as a source of air supply, the actual operating expense (electric power) is



proportional to the amount of air required. Operation is not continuous, occurring only when needed.

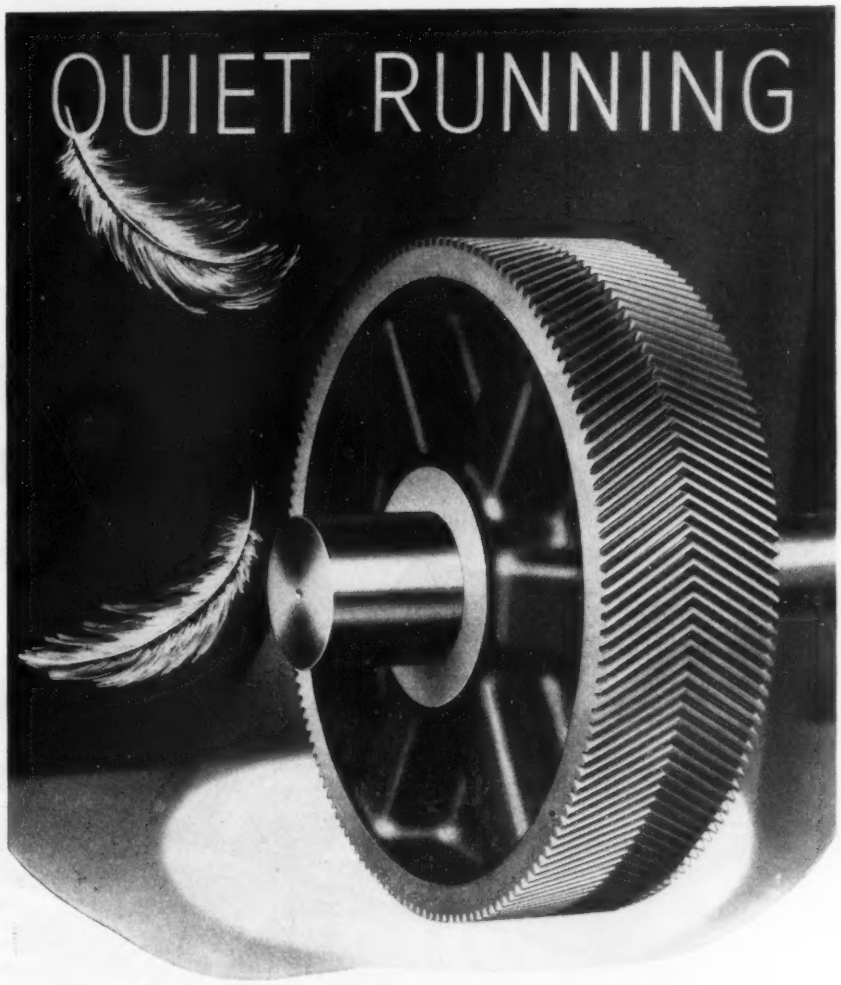
Two different air jet systems are available—the single and double manifold type. After such specifications as firing rate of the boiler, length and width of the grate and available floor space have been determined, the most suitable system is engineered to fit the application. System controls are either manual or automatic, whichever is preferred. If automatic control is desired, a photoelectric cell is installed in the stack and interconnected with the blower starter.

Check No. 9 on Reply Card for more Details

Hole Gages, Pin Vises

Holes ranging from ⅛ to ½-inch in diameter may be measured with set No. 78S small hole gages, manufactured by Lufkin Rule Co., Saginaw, Mich. Gages have the ball end flattened off close to the center line which permits gaging holes and shallow recesses. Size of ball end is adjusted by turning the knurled knob at the opposite end of the gage. Change in size of the ball end is almost proportional to the movement of the knob. Gages are offered in the range of 1/8 to 3/16-inch, 3/16 to 1/4-inch, 1/4 to 3/8-inch and 3/8 to 1/2-inch.

Also announced by the company are pin vises for holding small stock to be worked as well as for holding taps, drills, scribers and small files.



HERRINGBONE GEARS
by Horsburgh & Scott

● Here's why Horsburgh & Scott Herringbone gears are quiet and smooth running at all speeds . . . 1. Sykes type where two or more teeth are always in contact. 2. Teeth accurately generated on finest gear cutting machines with correct amount of backlash. 3. End thrust entirely eliminated. 4. Pitch line absolutely concentric with bore. 5. Rims, arms and hub extra heavy for pitch of gear. It will pay you to try these superb gears.

Send note on Company Letterhead for 488-Page Catalog 41

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 HAMILTON AVENUE • CLEVELAND 14, OHIO, U. S. A.

You Win on Every Move!

Every product in this new catalog is KENNAMETAL, made to be a winner in productivity . . . in cost-saving

With Catalog 49 is a discount sheet announcing a 25% reduction in the price of standard brazed tools listed. Savings in production costs effected by improved manufacturing techniques enable us to give you this plus value.

Outstanding durability is inherent with Kennametal. Its structure is consistently sound, hardness is uniform, strength unusually high. All processing is done in our own plant, from the refining of raw materials to fabrication of complete tools. The methods and equipment used are original and exclusive. Every step is subjected to rigid laboratory control and physical inspection.

On metal-working tools the superior merits of Kennametal are manifest in longer life, reduced grinding expense, lower tool inventory, less machine down time, greater operator efficiency.

As parts of machines, particularly those subjected to wear, the noteworthy properties of Kennametal are evident in greater durability and better performance than ever realized with any other metal.

A new grade of Kennametal, developed to provide high resistance to oxidation at elevated temperatures, has many potential uses.

Our new Catalog 49 contains a wealth of information for metal-working plants. To secure your copy will be a good move. It suggests many subsequent moves that can be made to your advantage.

KENNAMETAL *Inc.*, Latrobe, Pa.

MANUFACTURERS OF SUPERIOR CEMENTED CARBIDES AND CUTTING TOOLS THAT INCREASE PRODUCTIVITY

Dull nickel plated to prevent glare, these vises have hardened jaws. A hole running through the entire handle affords the chuck a close-up grip, even on long rods. Knurling at convenient locations gives a firm hold. The model No. 197 vises are offered in the following capacities: 0 to 0.055-inch; 0.025 to 0.075-inch; 0.045 to 0.135-inch; 0.110 to 0.200-inch.

Check No. 10 on Reply Card for more Details

Buffing Machine

Increased production and better finishes may be attained with the four-spindle power indexing semi-automatic polishing and buffing machine announced by Hammond Machinery Builders Inc., 1627 Douglas Ave., Kalamazoo 54F, Mich. Ma-

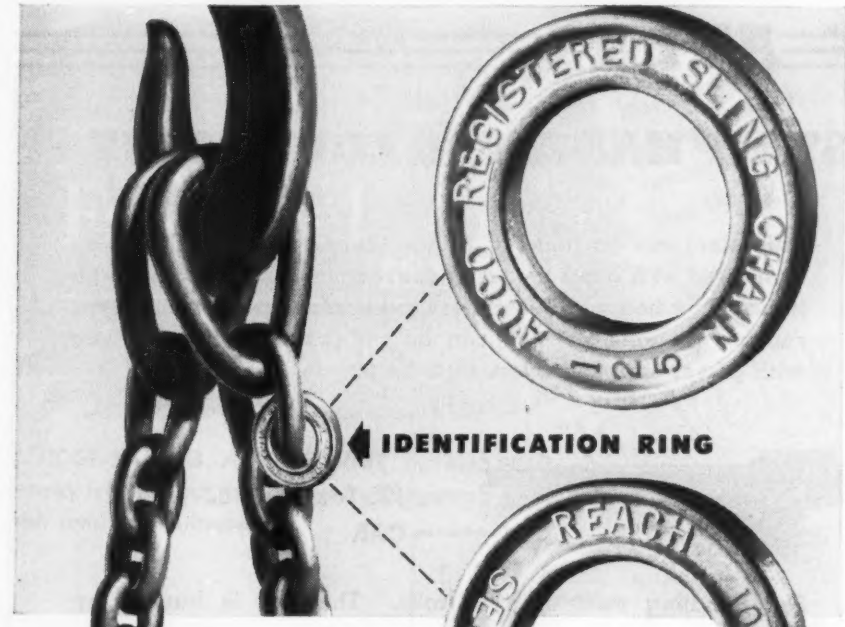
chine is suited for polishing or buffing on any lathe using wheels or abrasive belts and backstands. Variable speed power indexing range is from 250 to 600 indexes per hour. Single and two spindle models also are available.

Check No. 11 on Reply Card for more Details

Anode Hook

Anode scrap is reduced by as much as 50 per cent with a new type plating hook for elliptical anodes, announced by Udylite Corp., 1651 E. Grand Blvd., Detroit 11, Mich. This is possible because the hook allows the entire anode to be completely immersed in the plating solution. Hook is reusable, since it withstands all plating solutions and temperatures. It also makes possible the use of shorter anodes.

Hook design has a cap of Neoprene rubber which fits over the top of the elliptical anode. It has rubber



This drop-forged ring is permanently attached to each ACCO Registered Sling Chain. All essential identifying information shown on both sides of Ring, as illustrated, protected by outer flange.

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BY AMERICAN CHAIN

"The Nation's Chainmaker"

We believe that the best way to build safety into Sling Chains is to make each one individually—to inspect it and test it as though it were made to special order.

From that belief came the idea of ACCO Registered Sling Chains. Each sling chain made by AMERICAN CHAIN is Registered. Each one carries a Certificate of Test and Warranty. Every one is identified by a permanent metal ring on which is stamped all essential identifying information.

SEND for this catalog which contains information on how to select, use and care for sling chains. It is DH-80.

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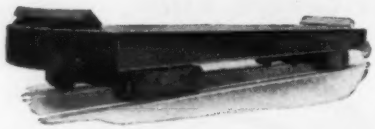
ATLAS

STRIP HANDLING EQUIPMENT

Strip steel can be handled very economically on rail cars as compared with other means of conveyance. Strip cars can be handled by heavy-duty rubber tired tractors or by locomotives running on rails, or they can be self-propelled motor-driven with power supplied by storage battery in the car.

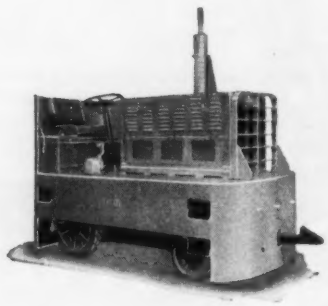


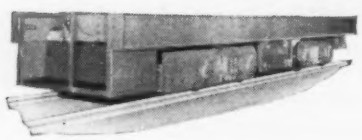
125-Ton DOUBLE TRUCK CAR

For handling steel strip in rolls. This car is hauled by tractor shown below.

SPECIAL HEAVY-DUTY GAS-ELECTRIC TRACTOR

For hauling 125-Ton Strip Handling Cars. Tractors run on rubber tires.



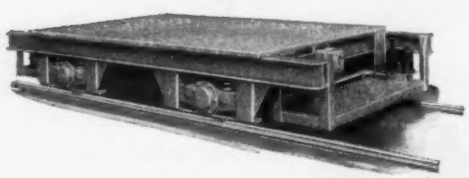


135-Ton FLAT CAR

Powered by storage battery for handling sheet steel.

25-Ton PLATFORM CAR

Powered by storage battery, operates at slow speed and has operator's platform at each end.



These Load Carrying Self-Propelled Cars have been readily adapted to handling a wide variety of commodities most economically.

They can also be provided with standard railway couplers to permit switching of standard railway cars where necessary.

ATLAS ENGINEERING SERVICE
IS ALWAYS AT YOUR SERVICE

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

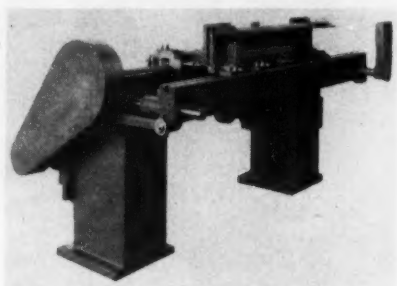
1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

shoulder-like projections which protect the center section of the anode where the threads of the hook fasten onto the anode proper. When hook is turned tightly into the anode, pressure of the hook against the cap seals the anode top to the hook and does not permit plating solutions to seep into the section where the hook threads enter the anode. Hook is offered in 6 and 8-inch sizes and fits all anode rods up to and including 1½ inches in diameter.

Check No. 12 on Reply Card for more Details

Special Drilling Unit

Moline Tool Co., Moline, Ill., is building the model SLD400 special drilling machine, an adaptation of the Moline spiral drive for in-line spindles to the drilling and counterboring for rivets. It consists principally of a rail carrying six horizontal in-line drill spindles and a magazine type work holding device which



presents one piece to the drills per machine cycle. Work holding magazine is adjustable to suit different lengths.

Adjustment of the in-line drill spindles for the various center distances makes it easy to set the machine up for different types of pieces or for various numbers of drills. Minimum center distance between adjacent spindles is 1 inch. When machine is in operation, the drills rotate continuously but have no feed travel. Feed mechanism is actuated by a crank motion driven by a small motor, to produce a reciprocating action. Piece is taken from the magazine and fed onto the drills. Production may be from 1000 to 1400 pieces per hour.

Check No. 13 on Reply Card for more Details

Bench Press

Hydraulic ram mounted on a chromium plated piston which travels in a steel cylinder features the type FM self-contained motorized hydraulic bench presses designed by Munton Mfg. Co., Franklin Park, Ill. Offered in 5, 18, 13 and 20 ton capacities, presses have a 3 hp, 220-440 v, 3 phase 60 cycle motor, hydraulic

pump, valves and piping enclosed in the housing of the unit. A hand lever actuates and releases the hydraulic ram. Motor driven hydraulic pump is controlled by a pushbutton switch.

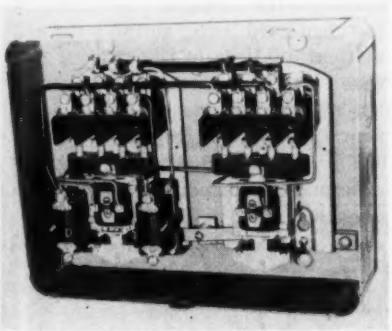
Ram has a stroke or travel of 9 inches. Downstroke is 100 inches per minute and return travel 125 inches per minute on the 5 ton press,

slightly less on the larger sizes. Height of throat or distance from ram to platen is 10¾ inches, platen measures 10 x 16 inches and overall press height is 53 inches. Width and depth are 14 and 10 inches respectively.

Check No. 14 on Reply Card for more Details

Reversing Starters

Designed for industrial control applications such as machine tools is a line of alternating current magnetic reversing starters of the across-the-line type, made by Ward Leonard



Electric Co., Mt. Vernon, N. Y. Three pole starters are available for across-the-line starting and reversing of polyphase motors to 200 hp, 550 v, 60 cycles inclusive. Four pole starters with rating of 7½ hp, 550 v, 60 cycles maximum are suitable for use with externally reversible single

NEW! Fansteel "77" METAL

for maximum metal density, mass or inertia in limited space

PROVEN!

A COST-SAVING ACHIEVEMENT in high density (closely approaching pure Tungsten), with ready machinability.

For parts for rotational control within confined space

- Easily brazed, or silver-soldered by ordinary methods.
- rotors, flywheels, governors, balance weights. Entire rotor can be made of Fansteel "77"—or ring of "77" attached to lower density backing—or inserts or studs brazed or screwed to backing.

Radiation shields

- Fansteel "77" is approximately 1.5 times as effective as lead in absorption of radiation. Requires less wall thickness.

Electrolytic fixtures

- Resists attack by solutions. Has great strength with good electrical conductivity. Excellent for current-carrying and contact-making hooks, fixtures, guides or carriers.

Available forms

- square or rectangular bars, round rods, rings, disks, slabs or special shapes—either "as sintered" or finished or semi-finished machined parts.

• ASK FOR FANSTEEL TECHNICAL DATA BULLETIN NO. 5.102. Fansteel engineers will gladly assist in any problem where "77" can be applied; also in design, production, machining and finishing. Fansteel Metallurgical Corporation, North Chicago, Illinois.

PURE METALS
Tantalum, Tungsten, Molybdenum, and Columbium in sheet, rod, wire and special shapes and parts.

POWDER METALLURGY PRODUCTS
Finished or semi-finished shapes and parts of special analysis to achieve high strength, density, electrical conductivity, resistance to wear, impact, heat erosion, or combinations of these and other properties.

COPPER BASE ALLOYS
Copper alloyed with other elements, to combine high conductivity with strength, elasticity, resistance to heat, impact, or wear. Available in bars, rod, sheet, strip, castings, forgings, finished or semi-finished parts, for current-carrying springs and other parts, soldering tips, resistance welding electrodes, dies and fixtures.

11603-B

Fansteel
SPECIAL PRODUCTS
In Controlled Metallurgy

phase motors of the four-wire split phase, capacitor or repulsion induction types.

Starters consist of two magnetic contactors interwired for reversing operation mechanically interlocked, with or without thermal overload protection. Standard models have sheet steel NEMA type 1 general purpose enclosures. On special order they can be furnished without enclosures for built-in or switchboard applications. Units are built for inching, jogging or plug-stop service as well as direct reversing service.

Check No. 15 on Reply Card for more Details

Drill Head

U. S. Drill Head Co., Cincinnati 4, O., is producing a fixed center oil circulating head, designed for high speeds, but also usable for large cluster boxes on way type machines. Ball bearing equipped, the 34-spindle, 6-inch square head, has been operated at 10,000 rpm with very little heat. Idler shafts are mounted on ball bearings at each end of the shaft. Ball bearings used in the spindles are of the angular contact type which holds the runout at the end of the tool to a minimum.

Head contains an oil pump with built-in, vane type pump, which circulates oil to the top of the head and by centrifugal force, spreads it over its entire upper surface, then cascades it down over the bearings and gears. Castings are made of aluminum alloy and spindles and shafts are made of heat treated and ground alloy steels.

Check No. 16 on Reply Card for more Details

• • •

ELECTRICAL COUPLING: A quick disconnect electrical coupling for all-weather applications has been developed by Roylyn Inc., Glendale, Calif. Designated as 1600 series, the couplings are provided either with pressure tight cable seals or are threaded for attachment to conduit, bulkheads or panels.

Check No. 17 on Reply Card for more Details

STRAINERS: A new line twin strainers is announced by accessories department, Elliott Co., Jeannette, Pa. They are built in sizes up to 24 inches for removing foreign matter from water, oil and other liquids at pressures up to 125 and 250 psi.

Check No. 18 on Reply Card for more Details

CHUCK: Whiton Machine Co., New London, Conn., announces the Whitaloy chuck with a body forged of a special analysis heat treated aluminum alloy, thereby reducing weight. It features increased holding capacity of small spindle lathes through lighter spindle loads. It is available in all sizes and types up to 15 inches.

Check No. 19 on Reply Card for more Details

ROTARY PUMP: The sliding vane type pump has been added to the line of rotary pumps made by Blackmer Pump Co., Grand Rapids, Mich. Extremely viscous liquids up to 100,000 SSU may be pumped with this unit. Vanes are positively actuated by push rods through the rotor and shaft.

Check No. 20 on Reply Card for more Details

ELECTRODE: Developed for maintenance and production work on special steels of high-alloy and high carbon types, a new electrode is announced by All-State Welding Alloys Co. Inc., White Plains, N. Y. Identified as No. 252, it has a tensile strength of 85,000 to 95,000 psi and is an alternating current-direct current electrode.

Check No. 21 on Reply Card for more Details

HOSE: Air Reduction Sales Co., New York 17, N. Y., announces ¾ and 1-inch single line Neoprene hose for welding and cutting accessories. Both can be used with oxygen equipment at working pressures of 200 psi. Inner lining of hose is made of Neoprene rubber, remainder is of vulcanized natural rubber content and tough braided fabric.

Check No. 22 on Reply Card for more Details

BEARING TOOL: Worn sleeve bearings can be removed from motor endplates and new bearings inserted in one operation with a new tool developed by Wagner Electric Corp., St. Louis 14, Mo. It is available in four sizes for motors with finished bearing sizes of 0.655, 0.751, 0.812 and 1.062-inches.

Check No. 23 on Reply Card for more Details

LIQUID FLOW CONTROLLER: A new model Transometer which will generate an air pressure signal from 2 to 15 pounds has been designed by Askania Regulator Co., Chicago, Ill. It can be used directly with present types of air operated controllers, eliminating necessity for a transformer to convert usual Transometer low pressure signals to desired 2-15 psi values.

Check No. 24 on Reply Card for more Details

INTERCOM SYSTEM: Executone Inc., New York 17, N. Y., has developed a fully-selective, explosion-proof, electronic intercom system that is particularly suited for plants where atmosphere in work areas contains certain highly inflammable and explosive gases or vapors. Stations in hazardous areas can call those in either hazardous or nonhazardous areas. Person called can answer from any reasonable distance without stopping his work or approaching his station.

Check No. 25 on Reply Card for more Details

STAPLING HAMMER: Bostich, Westerly, R. I., offers a new heavy-duty automatic stapling hammer. Model H4 drives staples with a ½-inch crown and ¾-inch legs and the staples are so engineered that legs diverge inside the work, putting them under tension and increasing their holding power.

Check No. 26 on Reply Card for more Details

VALVES: The new V8 series oil-hydraulic control valves announced by Hydraulic Equipment Co., Cleveland 17, O., are for large volume oil-hydraulic systems for road building and earthmoving machinery, heavy duty industrial equipment and hydraulic presses. Valve will handle 80 gallons of oil per minute at operating pressures up to 1000 psi.

Check No. 27 on Reply Card for more Details

DRAWING LUBRICANT: Designated as Murphy process No. 1 drawing oil, a new drawing lubricant is announced by Phoenix Oil Co., Cleveland 5, O. It can be applied directly to blanks by rolls, swab or spray as it has the consistency and appearance of medium viscosity oil. For lighter work it is mixed with water.

Check No. 28 on Reply Card for more Details

COMPUTING SERVICE: Telecomputing Corp., Burbank, Calif., has developed and is manufacturing special equipment for reading data from graphs, film or tape records and converting the results directly into punched card form, suitable for arithmetical analysis in the field of structure, electronics, chemistry, physics, hydraulics, etc., as well as computation of manufacturing and production study tables and statistical analysis determining correlation functions, frequencies, etc.

Check No. 29 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

THE STEEL markets developed something of the jitters last week with the outcome of the labor dispute in the industry injecting a degree of uncertainty almost without precedent. Lacking definite word whether there would be a selective strike, or no strike at all, steel users all week long sought to expedite mill shipments. Many expected to rely on inventories to bridge the expected gap in mill shipments.

IMPACT— Effect of a strike on the steel markets at this time would be difficult to appraise. Much would depend on the extent of the walkout, the number and capacity of plants involved, and length of the work stoppage. Feeling in the trade is that immediate repercussions from any walkout would be less severe than in the 1946 strike. Then steel shortages prevailed on every side and consumers' inventories were virtually non-existent. Conditions today are the reverse of those three years ago. Demand-supply balance has been attained in the various product markets and consumers' inventories, generally speaking, are sufficiently high to bridge a substantial gap in mill shipments for some time in view of the slower pace of manufacturing activity. Automotive industry stocks are reported adequate for several weeks.

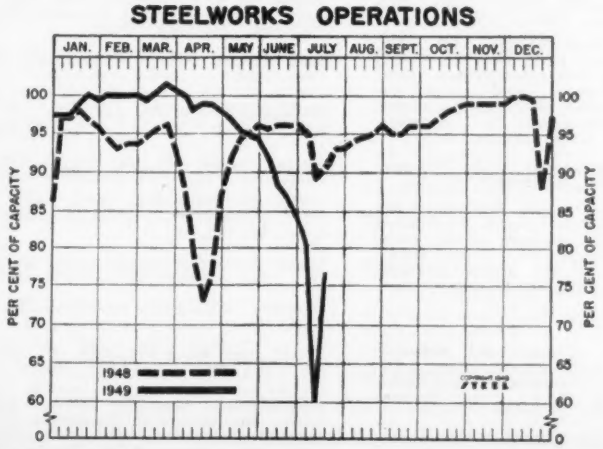
RAW MATERIALS—Some suppliers to strike-threatened steel plants last week received shipment holdup instructions as the mills prepared for a walkout. Plans were made for banking some blast furnaces and the stockpiling of iron ore last week. One steelmaker informed ore shippers it would not accept deliveries at its docks after midnight, July 15. In event of a prolonged strike lake shipping would be adversely affected since the steel companies would be compelled to tie up loaded ore vessels at lower lake ports once stockpiling facilities at such points became jammed. Shipment suspension orders were issued by some producers to scrap, oil and other mill suppliers, but the extent of such holdups was impossible to determine because of the state of flux in the status of the labor dispute, and the uncertainty as to the scope of the strike should it actually transpire. It was thought holdup of scheduled mill shipments would further depress scrap prices.

DEMAND— Some slight quickening of inquiry for pig iron and steel products was reported at a few points as the threat of a strike became increasingly ominous. However, sellers said this inquiry meant little since it came too late for them to do much about satisfying such protective buying. The steelmakers continued to ship on schedule through the week with new buying light. Here and there reduction of consumer inventories below the safety point is reported and this is expected to result in a spurt in ordering before long. Meanwhile, steel consumption continues on the downside, in part due to vacation curtailments and shutdowns.

OPERATIONS—Steelmaking operations snapped back sharply last week from the holiday week slump. The national ingot rate was estimated at 77 per cent of capacity, a gain of 17 points over the preceding week. This represented a sharper recovery than had been expected, and was only three points below the rate in effect just prior to the holiday.

PRICES— Few changes of note were effected in steel prices last week. Another producer announced adoption of lower polishing extras on stainless steel sheets and some warehouses were reported taking similar action. Reflecting an easing in the open market for sheet bars, STEEL's composite for semifinished steel declined last week to $62.12 from $63.12 the preceding week and compared with $68.62 in the like week a year ago. Other composites held unchanged and compared with those for the like week last year as follows: Finished steel, $91.82 and $80.27; steelmaking pig iron, $45.60 and $40.74; steelmaking scrap, $19.17 and $40.83.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended July 16	Change	Same Week 1948	Same Week 1947
Pittsburgh	73.5	+20*	88	98.5
Chicago	93.5	+26*	85	90
Eastern Pa.	80	+12	90	94
Youngstown	75	+25	94	80
Wheeling	81	+13	92	83.5
Cleveland	75.5	+11*	94.5	92
Buffalo	87.5	+ 2.5	101	88.5
Birmingham	100	None	100	99
New England	40	+ 2	83	87
Cincinnati	96	+24	98	87
St. Louis	75.5	None	82	82
Detroit	102	+11*	100	92
Western	75	— 4.5	..	..
Estimated national rate	77	+17	90.5	92.5

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947. *Revised.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	July 16	July 9	Month Ago June 1949	Year Ago July 1948	5 Years Ago July 1944
Finished Steel	$91.82	$91.82	$92.06	$80.27	$56.73
Semifinished Steel	62.12	63.12	65.28	68.62	36.00
Steelmaking Pig Iron	45.60	45.60	45.60	40.49	23.00
Steelmaking Scrap	19.17	19.17	20.85	40.67	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

June 1949	4.01731c
May 1949	4.01731c
Apr. 1949	4.02031c
June 1948	3.57740c
June 1944	2.46683c

* **STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin pate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

† **FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. June, 1949, figure is preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

Finished Materials

	July 16, 1949	June, 1949	Apr., 1949	July, 1948
Steel bars, Pittsburgh mills	3.35c	3.35c	3.35c	3.105c
Steel bars, del. Philadelphia	3.8164	3.8164	3.8164	3.545
Steel bars, Chicago mills	3.35	3.35	3.35	3.065
Shapes, Pittsburgh mills	3.25	3.25	3.25	2.975
Shapes, Chicago mills	3.25	3.25	3.25	2.965
Shapes, del. Philadelphia	3.4918	3.4918	3.4918	3.18
Plates, Pittsburgh mills	3.40	3.40	3.50	3.155
Plates, Chicago mills	3.40	3.40	3.40	3.115
Plates, del. Philadelphia	3.5848	3.5848	3.6348	3.41
Sheets, hot-rolled, Pittsburgh mills	3.25	3.25	3.26	2.975
Sheets, cold-rolled, Pittsburgh	4.00	4.00	4.00	3.70
Sheets, No. 10 galv., Pittsburgh	4.40	4.40	4.40	4.10
Sheets, hot-rolled, Gary mills	3.25	3.25	3.25	2.965
Sheets, cold-rolled, Gary mills	4.00	4.00	4.00	3.70
Sheets, No. 10 galv., Gary mills	4.40	4.40	4.40	4.10
Strip, hot-rolled, Pittsburgh mills	3.25	3.25	3.50	3.140
Strip, cold-rolled, Pittsburgh mills	4.375	4.375	4.375	3.965
Bright basic, wire, Pittsburgh	4.15	4.15	4.15	3.965
Wire nails, Pittsburgh mills	5.15	5.15	5.15	5.255
Tin plate, per base box, Pitts. dist.	$7.75†	$7.75†	$7.75†	$6.74

Semifinished

Sheet bars, mill	$67.00*	$67.00*	$67.00*	$62.80
Slabs, Chicago	52.00	52.00	52.00	47.80
Rerolling billets, Pittsburgh	52.00	52.00	52.00	47.80
Wire rod $\frac{5}{32}$ to ¼-inch, Pitts. dist.	3.40c	3.40c	3.775c	3.415c

* Nominal. † 1.50 lb coating.

Pig Iron

	July 16, 1949	June, 1949	Apr., 1949	July, 1948
Bessemer, del. Pittsburgh (N.&S. sides)	$48.08	$48.08	$48.08	$44.08
Basic, Valley	46.00	46.00	46.00	40.60
Basic eastern, del. Philadelphia	49.39	49.39	49.6175	43.77
No. 2 fdry., del. Pgh. (N.&S. sides)	47.58	47.58	47.58	43.58
No. 2 fdry., del. Philadelphia	49.89	49.89	50.1175	44.27
No. 2 foundry, Chicago	46.25	46.25	46.25	41.10
No. 2 foundry, Valley	46.50	46.50	46.50	41.10
Southern No. 2 Birmingham	39.38	39.38	43.38	40.72
Southern No. 2 del. Cincinnati	45.43	45.43	49.43	46.43
Malleable, Valley	46.50	46.50	46.50	40.30
Malleable, Chicago	46.50	46.50	46.50	41.50
Charcoal, low phos., fob Lyles, Tenn.	66.00	66.00	66.00	59.60
Ferromanganese, f.o.b. Etna, Pa.	175.00	175.00	175.00	150.00

SCRAP

Heavy melt. steel, No. 1, Pittsburgh	$21.00	$22.60	$25.12	$40.75
Heavy melt. steel, No. 2, E. Pa.	16.00	17.75	20.69	40.00
Heavy melt. steel, No. 1, Chicago	19.50	20.70	23.75	40.05
Heavy melt. steel, No. 1 Valley	18.50	21.30	22.75	40.75
Heavy melt. steel, No. 1 Cleveland	15.00	17.80	20.38	40.25
Heavy melt. steel, No. 1, Buffalo	19.25	20.35	24.38	44.30
Rails for rerolling, Chicago	27.75	27.75	31.31	57.80
No. 1 cast, Chicago	27.50	27.50	30.25	68.50

COKE

Connellsville, beehive furnace	$13.25	$13.70	$14.44	$14.25
Connellsville, beehive foundry	15.75	16.15	17.00	17.00
Chicago, oven foundry, ovens	20.00	20.24	20.40	19.86

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, nominal. Forging quality, $50 per net ton mill.

Alloy Steel Ingots: $51 per net ton, mill.

Rerolling Billets, Blooms, Slabs: $52 per net ton, mill, except: $57, Conshohocken, Pa.; $71, Fontana, Calif.

Forging Quality Billets, Blooms, Slabs: $61 per net ton, mill, except: $63, Conshohocken, Pa.; $80, Fontana, Calif.

Alloy Billets, Slabs, Blooms: Rerolling quality, $63 per net ton, mill except: $65 Conshohocken, Pa.; $82, Fontana, Calif.

Sheet Bars: Nom., per net ton, mill; sales in open market $50-$55 per gross ton.

Skelp: 3.25c per lb, mill.

Tube Rounds: $76 per net ton, mill.

Wire Rods: Basic and acid open-hearth, 7/32 & ⅝-inch, inclusive, 3.40c per lb, mill, except: 3.70c, Worcester, Mass.; 4.05c, Pittsburg, Calif.; 4.10c, Los Angeles. Basic open-hearth and bessemer, 7/32 to 47/64-in., inclusive, 3.50c, Sparrows Point, Md.

Bars

Hot-Rolled Carbon Bars (O.H. only; base 20 tons): 3.35c, mill, except: 3.50c Atlanta; 3.55c, Ecorse, Mich.; 3.75c, Houston; 3.95c, Kansas City; 4.00c, Fontana, Calif.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, S. San Francisco, Los Angeles, Niles, Calif.; Portland, Oreg., Seattle; 4.25c, Minnequa, Colo.

Rail Steel Bars: (Base 10 tons): 3.35c Huntington, W. Va., and Moline, Ill.; 4.00c, Williamsport, Pa.

Hot-Rolled Alloy Bars: 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 4.75c, Fontana, Calif.

Cold-Finished Carbon Bars (Base 40,000 lb and over): 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.20c, Indianapolis; 4.30c, Ecorse, Mich.; 4.35c, St. Louis; 4.36c, Plymouth, Mich.; 4.40c Newark, N. J., Hartford, Putnam, Conn., Mansfield, Readville, Mass.; 4.48c, Camden, N. J.; 5.40c, Los Angeles.

Cold-Finished Alloy Bars: 4.65c, mill, except: 4.85c, Indianapolis; 4.95c, Worcester, Mansfield, Mass., Hartford, Conn.

High-Strength, Low-Alloy Bars: 5.10c, mill, except: 5.30c, Ecorse, Mich.

Reinforcing Bars (New Billet): 3.35c, mill, except: 3.50c, Atlanta; 4.00c, Fontana, Calif.; 3.75c, Houston; 3.95c, Kansas City; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, Seattle, S. San Francisco, Los Angeles; 4.25c, Minnequa, Colo. Fabricated: To consumers: 4.25c, mill, except: 5.00c, Seattle.

Reinforcing Bars (Rail Steel): 3.85c, Williamsport, Pa., mill; 3.35c, Huntington, W. Va.

Wrought Iron Bars: Single Refined: 8.60c, (hand puddled), McKees Rocks, Pa.; 9.50c, Economy, Pa. Double Refined: 11.25c (hand puddled), McKees Rocks, Pa.; 11.00c, Economy, Pa. Staybolt: 12.75c, (hand puddled), McKees Rocks, Pa.; 11.30c, Economy, Pa.

Sheets

Hot-Rolled Sheets (18-gage and heavier): 3.25c, mill, except: 3.45c, Ecorse, Mich.; 3.65c, Houston; 3.35c, Conshohocken, Pa.; 3.95c, Pittsburg, Torrance, Calif.; 4.15c, Fontana Calif.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 4.40c, Alabama City, Ala.; 5.05c, Torrance, Calif.; 5.25c, Kokomo, Ind.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c, Ecorse, Mich., Granite City, Ill.; 4.90c, Fontana, Calif.; 4.95c, Pittsburg, Calif.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) 4.40c, mill, except: 4.80c, Kokomo, Ind.; 5.15c, Pittsburg, Torrance, Calif.

Galvannealed Sheets: 4.95c, mill, except: 5.30c, Kokomo, Ind.

Culvert Sheets, No. 16 flat Copper Steel (based on 5-cent zinc): 5.00c, mill, except: 5.40c, Granite City, Ill.. Kokomo, Ind.; 5.75c, Pittsburg, Torrance, Calif.

Long Ternes, No. 10 (Commercial quality): 4.80c, mill.

Enameling Sheets, No. 12: 4.40c mill, except: 4.60c Granite City, Ill.; 4.70c, Ecorse, Mich.

Silicon Sheets, No. 24: Field: 5.15c, mill. Armature: 5.45c, mill, except: 5.95c, Warren.

Electrical: Hot-rolled, 5.95c, mill, except: 6.05c, Kokomo, Ind.; 6.15c, Granite City, Ill.; 6.45c, Warren, O.

Motor: 6.70c mill, except: 6.90c, Granite City, Ill.; 7.20c, Warren, O.

Dynamo: 7.50c, mill, except: 7.70c, Granite City, Ill.

Transformer 72, 8.05c, mill; 65, 8.60c, mill, 58, 9.30c, mill, 52, 10.10c, mill.

High-Strength Low-Alloy Sheets: Hot-rolled, 4.95c, mill, except: 5.15c, Ecorse, Mich. Galvanized (No 10), 6.75c, mill. Cold-rolled, 6.05c, mill, except: 6.25c, Ecorse, Mich.

Strip

Hot-Rolled Strip: 3.25c mill, except: 3.40c, Atlanta; 3.45c, Ecorse, Mich.; 3.60c, Detroit; 3.65c, Houston; 3.85c, Kansas City, Mo.; 4.00c, Pittsburg, Torrance, Calif.; 4.25c, Seattle, San Francisco, Los Angeles; 4.30c, Minnequa, Colo.; 4.40c, Fontana, Calif. One company quotes 4.90c, Pittsburgh base.

Cold-Rolled Strip (0.25 carbon and less); 4.00c, mill, except: 4.00-4.25c, Warren, O.; 4.15c, Riverdale, Ill.; 4.20c, Ecorse, Mich.; 4.20-4.25c, Detroit; 4.25c, Dover, O.; 4.50c, New Haven and Wallingford, Conn., Boston; 4.50-5.00c, Trenton, N. J.; 4.90c, Fontana, Calif.; 5.75c, Los Angeles. One company quotes 4.50c, Pittsburgh base; another, 4.55c, Cleveland or Pittsburgh base, and 4.75c, Worcester, Mass., base.

Cold-Finished Spring Steel: 0.26-0.40 C, 4.00c, mill, except: 4.25c, Dover, O., Chicago; 4.30c, Worcester, Mass.; 4.50c, Boston, Youngstown, Wallingford, Conn. Over 0.40 to 0.60 C, 5.50c, mill except: 5.65c, Chicago; 5.75c, Dover, O.; 5.80c, Worcester, Mass., Wallingford, Conn., Trenton, N. J.; 5.95c, Boston. Over 0.60 to 0.80 C, 6.10c, mill, except: 6.25c, Chicago; 6.35c, Dover, O.; 6.40c, Worcester, Mass. ,Wallingford, Conn., Trenton and Harrison, N. J. Over 0.80 to 1.05 C, 8.05c, mill, except: 7.85c, Dover, O.; 8.20c, Chicago; 8.35c, Worcester, Mass., Bristol, Conn., Trenton and Harrison, N. J. Over 1.05 to 1.35 C, 10.35c, mill, except: 10.15c, Dover, O.; 10.50c, Chicago; 10.65c, Worcester, Mass., Trenton and Harrison, N. J.

Cold-Rolled Alloy Strip: 9.50c, mill except: 9.80c, Worcester, Mass., Harrison, N. J.

High-Strength, Low-Alloy Strip: Hot-rolled, 4.95c, mill, except: 5.15c, Ecorse, Mich. Cold-rolled, 6.05c, mill, except: 6.25c, Ecorse, Mich.

Tin, Terne, Plate

Tin Plate: American Coke, per base box of 100 lb, 1.25 lb coating $7.50-$7.70; 1.50 lb coating $7.75-$7.95. Pittsburg, Calif., mill $8.25 and $8.50, respectively, for 1.25 and 1.50 lb coatings.

Electrolytic Tin Plate: Per base box of 100 lb, 0.25 lb tin, $6.45-$6.65; 0.50 lb tin, $6.70-$6.90; 0.75 lb tin, $7.00-$7.20.

Can Making Black Plate: Per base box of 100 lb, 55 to 128 lb basis weight $5.75-$5.85. Pittsburg, Calif., mill, $6.50.

Holloware Enameling Black Plate: 29-gage, 5.30c per pound, except: 5.40c, Sparrows Point, Md.; 5.50c, Granite City, Ill.

Manufacturing Ternes (Special Coated): Per base box of 100 lb, $6.65, except: $6.75 Fairfield, Ala., Sparrows Point, Md.

Roofing Ternes: Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb, $17.50.

Plates

Carbon Steel Plates: 3.40c, mill, except: 3.50c, Coatesville, Pa., Claymont, Del., Conshohocken, Pa., Harrisburg, Pa.; 3.65c, Ecorse, Mich.; 3.80c, Houston; 4.00c, Fontana, Calif.; 4.30c, Seattle, Minnequa, Colo.; 6.25c, Kansas City, Mo.

Floor Plates: 4.55c, mill.

Open-Hearth Alloy Plates: 4.40c, mill, except: 4.50c, Coatesville, Pa., mill.

High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.40c, Ecorse, Mich.

Shapes

Structural Shapes: 3.25c, mill, except: 3.30c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.; 3.65c, Houston; 3.80c, S. San Francisco, Fontana, Calif; 3.85c, Kansas City, Mo., Torrance, Calif.; 4.15c, Minnequa, Colo.; 4.30c, Seattle, Los Angeles.

Alloy Structural Shapes: 4.05c, mill.

Steel Sheet Piling: 4.05c, mill.

High-Strength, Low-Alloy Shapes: 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.25c, Sparrows Point, Md., Kokomo, Ind.; 4.45c, Worcester, Mass.; 4.50c, Minnequa, Colo., Atlanta, Buffalo; 4.75c, Kansas City Mo.; 4.80c, Palmer, Mass.; 5.10c, Pittsburg, Calif.; 5.15c, S. San Francisco. One producer quotes 4.15c, Chicago base; another 4.50c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Basic MB Spring Wire, 5.55c, mill, except: 5.65c, Sparrows Point, Md.; 5.85c, Worcester, Palmer, Mass., Trenton, N. J.; 6.50c, Pittsburg, Calif.

Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md., Williamsport, Pa.; 5.50c, Worcester, Mass., Trenton, N. J., New Haven, Conn.; 6.15c, Pittsburg, Calif.

Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill except: 4.90c, Sparrows Point, Md., Kokomo, Ind.; 4.95c, Atlanta; 5.10c Worcester, Mass.; 5.15c, Minnequa, Colo.; 5.75c, S. San Francisco, Pittsburg, Calif. One producer quotes 4.80c, Chicago and Pittsburgh base; another, 5.20c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Galvanized (6 to 8 Gage base), 5.25c, mill, except: 5.35c, Sparrows Point, Md., Kokomo, Ind.; 5.40c, Atlanta; 5.55c, Worcester, Mass.; 5.60c, Minnequa, Colo.; 6.20c, Pittsburg, S. San Francisco, Calif. One producer quotes 5.25c, Pittsburgh and Chicago base; another, 5.65c, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Col. 103, mill, except: 105, Sparrows Point, Md., Kokomo, Ind., Atlanta; 109, Worcester, Mass.; 110, Minnequa, Colo., Cleveland; 123, Pittsburg, Calif. One producer quotes Col. 103, Chicago and Pittsburgh base; another, Col. 113, Crawfordsville, Ind.; 111 Houston, freight equalized with Birmingham and Pittsburgh.

Woven Fence (9 to 15½ Gage, inclusive): Col. 109, mill, except: 111, Kokomo, Ind., Atlanta; 116, Minnequa, Colo.; 132, Pittsburg, Calif. One producer quotes Col. 109, Pittsburgh and Chicago base; another, Col. 114, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Barbed Wire: Col. 123 mill, except: 125, Sparrows Point, Md., Kokomo, Ind., Atlanta; 130, Minnequa, Colo.; 143, Pittsburg, Calif.; 145, S. San Francisco. One producer quotes Col. 123, Chicago and Pittsburgh base.

Fence Posts (with clamps): Col. 114, Duluth; 121, Moline, Ill.; 122, Minnequa, Colo.; 125, Johnstown, Pa.; $120 per net ton, Williamsport, Pa.

Bale Ties (single loop): Col. 106, mill, except: 107, Atlanta; 108, Sparrows Point, Md., Kokomo, Ind.; 113, Minnequa, Colo.; 130, S. San Francisco, Pittsburg, Calif. One producer quotes Col. 115, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Bolts, Nuts

Prices to consumers, f.o.b. midwestern plants. Sellers reserve right to meet competitors' prices, if lower. Additional discounts on carriage and machine bolts, 5 for carloads; 15 for full containers, except tire and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	35 off
⅝ and ⅝ x 6-in. and shorter	37 off
¾-in. and larger x 6-in. and shorter	34 off
All diameters longer than 6-in.	30 off
Tire bolts	25 off
Plow bolts	47 off
Lag bolts, 6 in. and shorter	37 off
Lag bolts, longer than 6 in.	35 off

Stove Bolts

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

	A.S. Light	A.S. Reg. and Heavy
Semifinished hexagon		
⅞-in. and smaller	41 off	.....
½-in. and smaller	.....	38 off
½-in.-1-in.	39 off	.....
⅝-in.-1-in.	.....	37 off
1⅛-in.-1½-in.	37 off	35 off
1⅝-in. and larger	34 off	28 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	46 off
Upset (1035 heat treated) ⅝ and smaller x 6 and shorter	40 off

Square Head Set Screws

Upset 1-in. and smaller	51 off
¾, ⅞, & 1 x 6-in. and shorter	35 off
Headless, ¼-in. and larger	31 off

Rivets

F.o.b. midwestern plants

Structural ½-in. and larger	6.75c
⅞-in. and under	48 off

Washers, Wrought

F.o.b. shipping point, to jobbers..Net to $1 off

For prices of stainless and tool steels please refer to July 11 issue, Page 131.

Tubular Goods

Standard Steel Pipe: Eastern mill carlot prices, threaded and coupled, to consumers about $200 a net ton. Discounts from base:

	Butt Weld			Butt Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	39½-	11-	1	46½-	30½-
	41½	13½		48½	33½
¼	37½-	13-	1¼	47-	31-
	39½	15½		49	34
⅜	34-	9½-	1½	47½-	31½-
	36	12½		49½	34½
½	41-	23½-	2	48-	32-
	43	26½		50	35
¾	44-	27½-	2½, 3	48½-	32½-
	46	30½		50½	35½
			3½ & 4	44½	29

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	40½	25	38½	23	28-	12½-
					38½	23
2½	44½	29	41½	26	33½-	18-
					41½	26
3	44½	29	41½	26	36-	20½
					41½	26
3½&4	42½-	26-	43½	28	38½-	23-
	46½	31			43½	28
5 & 6	42½-	26-	43½	28	43½	28
	44½	29				
7	....	....	....	....	43½	27

Line Steel Pipe: Mill prices in carlots to consumers abcut $200 a net ton.

	Butt Weld			Butt Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	40½	12½	1¼	46-	32-
¼	38½	14½		48	33
⅜	35	11½	1½	46½-	32½-
½	40-	24½-		48½	33½
	42	25½	2	47-	33-
¾	43-	28½-		49	34
	45	29½	2½ & 3	47½-	33½-
1	45½-	31½-		49½	34½
	47½	32½	3½ & 4	43½	28

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	39½	24	37½	22	27-	11½-
					37½	22
2½	43½	28	40½	25	32½-	17-
					40½	25
3	43½	28	40½	25	35-	19½-
					40½	25
3½-4	41½-	28½-	42½	27	37½-	22-
	45½	30			42½	27
5 & 6	41½-	28-	42½	27	42½	27
	43½	28½				
8	45½	29	44½	28	44½	28
10	45	28½	44	27½	44	27½
12	44	27½	43	26½	43	26½

Standard Wrought Iron Pipe: Mill price in carlots, threaded and coupled, to consumers about $200 a net ton.

	Blk.	Gal.		Lap Weld	
In.	Butt Weld		In.	Blk.	Gal.
⅜	+59	+90	1¼	+22	+47½
½	+20	+47	1½	+15½	+40
¾	+10	+36	2	+ 7½	+31
1 and			2½-3	+ 5	+26½
1¼	+ 4	+27	4	List	+20½
1½	— 2	+23½	4½-8	+ 2	+22
2	— 2½	+23	9-12	+12	+31½

Boiler Tubes: Net base c.l. prices, dollars per 100', mill; minimum wall thickness, cut lengths 4 to 24", inclusive.

O.D.	B.W.	Seamless		Elec. Weld	
In.	Ga.	H.R.	C.D.	H.R.	C.D.
1	13	11.50	13.39	13.00	13.00
1¼	13	13.62	15.87	13.21	15.39
1½	13	15.05	17.71	14.60	17.18
1¾	13	17.11	20.15	16.60	19.54
2	13	19.18	22.56	18.60	21.89
2¼	13	21.37	25.16	20.73	24.40
2½	12	23.54	27.70	22.83	26.88
2½	12	25.79	30.33	25.02	29.41
2¾	12	27.33	32.14	26.51	31.18
3	12	28.68	33.76	27.82	32.74
3¼	11	33.39	39.29	32.39	38.11
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78
4½	9	58.99	69.42	....	....
5	9	68.28	80.35	....	....
6	7	104.82	123.33	....	....

Pipe Cast Iron: Class B, 6-in. and over, $82.50-$93.50 per net ton, Birmingham; $87.50, Burlington, N. J.; 4-in. pipe, $5 higher; Class A pipe, $5 a ton over Class B.

Rails, Supplies

Rails: Standard, over 60-lb; $3.20 per 100 lb mill, except: $3.30, Minnequa, Colo.
Light (billet): $3.55 per 100 lb, mill, except: $4.25, Minnequa, Colo.
Light (rail steel): $3.55 per 100 lb, Williamsport, Pa., Huntington, W. Va.
Railroad Supplies: Track bolts, treated: $8.50 per 100 lb, mill. Untreated: $8.25, mill.
Tie Plates: 4.05c mill, except: 4.20c, Pittsburg, Torrance, Calif.; 4.50c, Seattle.
Splice Bars: 4.25c, mill.
Standard Spikes: 5.35c, mill.
Axles: 5.20c, mill.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	$48.00	$48.50	$49.00	$49.50
Newark, N. J., del.	50.5334	51.0334	51.5334	52.0334
Brooklyn, N. Y., del.	....	52.634	53.134	....
Birmingham, furnace	38.88	39.38	....	....
Cincinnati, del.	....	45.43	....	....
Buffalo, furnace	46.00	46.50	47.00	....
Boston, del.	54.92	55.42	55.92	....
Rochester, del.	47.95	48.45	48.95	....
Syracuse, del.	49.39	49.89	50.39	....
§**Chicago,** district furnaces	46.00	46.00-46.50	46.50	47.00
Milwaukee, del.	47.82	47.82-48.32	48.32	48.82
Muskegon, Mich., del.	....	51.28-51.78	51.78	....
Cleveland, furnace	46.00	46.50	46.50	47.00
Akron, del.	48.3002	48.8002	48.8002	49.3002
Duluth, furnace	....	46.50	46.50	47.00
Erie, Pa., furnace	46.00	46.50	46.50	47.00
Everett, Mass., furnace	....	50.00	50.50	....
Geneva, Utah, furnace	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.0578	....	....
Portland, Oreg., del.	....	54.0578	....	....
Los Angeles, San Francisco	53.5578	54.0578	....	....
Granite City, Ill., furnace	47.90	48.40	48.90	....
St. Louis, del.	48.65*	49.15*	49.65*	....
Ironton, Utah, furnace	47.00	47.50	....	....
Lone Star, Tex., furnace	46.00	†46.50	....	....
Gulf ports, del.	50.50	51.00	....	....
‡**Neville Island, Pa.,** furnace	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	46.00	....	....	47.00
Sharpsville, Pa., furnace	46.00	46.50	46.50	47.00
Steelton, Pa., furnace	48.00	48.50	49.00	49.50
Struthers, O., furnace	46.00	....	....	....
Swedeland, Pa., furnace	48.00	48.50	49.00	49.50
Philadelphia, del.	49.39	49.89	50.39	50.89
Toledo, O., furnace	46.00	46.50	46.50	47.00
Cincinnati, del.	50.8230	51.3230	....	....
Troy, N. Y., furnace	48.00	48.50	49.00	....
Youngstown, O., furnace	46.00	46.50	46.50	47.00
Mansfield, O., del.	50.1022	50.6022	50.6022	51.1022

* Including 3 per cent federal transportation tax.
† Low phosphorus southern grade.
‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaca; $1.73 Verona; $1.94 Brackenridge; $1.08 for Ambridge and Aliquippa.
§ Includes, in addition to Chicago, South Chicago, Ill., East Chicago, Gary and Indiana Harbor, Ind.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base)..$59.50
6.51-7.00.. 60.50 9.01- 9.50. 65.50
7.01-7.50.. 61.50 9.51-10.00. 66.50
7.51-8.00.. 62.50 10.01-10.50. 67.50
8.01-8.50.. 63.50 10.51-11.00. 68.50
8.51-9.00.. 64.50 11.01-11.50. 69.50
F.o.b. Jackson, O., per gross ton. Buffalo furnace $1.25 higher.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $78.50 furnace, Niagara Falls; $80 open-hearth and foundry grade, Keokuk, Iowa, or Wenatchee, Wash., freight allowed to normal trade area. 12½ lb piglets, $85, Keokuk, Iowa, freight allowed to normal trade area. Add $1 a ton for each additional 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 a ton for 0.45% max. P.

Charcoal Pig Iron

Semi-cold blast, low phosphorous. F.o.b. furnace, Lyles, Tenn.....$66 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Low Phosphorus

Steelton, Pa., Troy, N. Y., $54; Philadelphia, $56.9786 del. Intermediate phosphorus, Central furnace, Cleveland, $51.

Electrodes

(Threaded, with nipples, unboxed)

Diam. (Inches)	Length (Inches)	Cents per lb, f.o.b. plant
Graphite		
17, 18, 20	60, 72	16.00
8 to 16	48, 60, 72	16.50
7	48, 60	17.75
8	48, 60	19.00
4, 5¼	40	19.50
3	40	20.50
2½	24, 30	21.00
2	24, 30	23.00
Carbon		
40	100, 110	7.50
35	100, 110	7.50
30	84, 110	7.50
24	72 to 104	7.50
17 to 20	84, 90	7.50
14	60, 72	8.00
10, 12	60	8.25
8	60	8.50

Fluorspar

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace	$13.00-13.50
Connellsville, foundry	15.50-16.00
New River, foundry	18.00
Wise county, foundry	15.35
Wise county, furnace	14.60

Oven Foundry Coke

Kearney, N. J., ovens	$22.00
Everett, Mass., ovens.	
New England, del.‡	22.70
Chicago, ovens	20.00
Chicago, del.	†21.45
Detroit, del.	23.76
Terre Haute, ovens	20.20
Milwaukee, ovens	20.75
Indianapolis, ovens	19.85
Chicago, del.	23.19
Cincinnati, del.	22.66
Detroit, del.	23.61
Ironton, O., ovens	19.40
Cincinnati, del.	21.63
Painesville, O., ovens	20.90
Buffalo, del.	23.42
Cleveland, del.	22.55
Erie, del.	22.70
Birmingham, ovens	17.70
Philadelphia, ovens	20.45
Swedeland, Pa., ovens.	20.40
Portsmouth, O., ovens.	19.50
Detroit, ovens	20.65
Detroit, del.	*21.70
Buffalo, del.	22.75
Flint, del.	22.98
Pontiac, del.	21.98
Saginaw, del.	23.30

Includes representative switching charge of: *, $1.05; †, $1.45. ‡ Or within $4.03 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens (Price effective as of Aug. 5)

Pure benzol	20.00
Toluol, one degree	19.00-23.50
Industrial xylol	20.50-26.50

Per ton bulk, ovens

Sulphate of ammonia	$45.00

Per pound, ovens (Effective as of Oct. 1)

Phenol, 40 (carlots, returnable drums)	13.50
Do., less than carlots	14.25
Do., tank cars	12.50
(Effective as of Oct. 25)	
Naphthalene flakes, balls, bbl to jobbers, "household use"	13.75

Refractories

(Prices per 1000 brick, f.o.b. plant)

Fire Clay Brick

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $100. Hard-fired, $135 at above points.
High-heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $80.
Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $74.
Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., Ottawa, Ill., $66.

Ladle Brick

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa.; Chester, New Cumberland, W. Va.; Irondale, Wellsville, O.
Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., Ottawa, Ill., $90; Beach Creek, Pa., $80.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., E. Chicago, Ind., $89; Lehi, Utah, Los Angeles, $95.
Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, $80.
Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $81.

Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)
Burned chrome brick, $66; Chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)
Domestic dead-burned, ⅜" grains; Bulk, $30.50-31.00; single paper bags, $35.00-35.50.

Dolomite

(Base prices per net ton)
Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural) Lower Lake Ports

(Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon effective after Dec. 31, 1948, are for buyer's account.)

Old range bessemer	$7.60
Old range nonbessemer	7.45
Mesabi bessemer	7.35
Mesabi nonbessemer	7.20
High phosphorus	7.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% concentrates, contract	16.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
Brazil iron ore, 68-69%	19.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26-$28

Manganese Ore

Long term contracts, involving large tonnages, prices are nominal; nearby, 48%, duty paid, 81.8c-83.8c per long ton unit, c.i.f. United States ports; prices on lower grades adjusted to manganese content and impurities.

Chrome Ore

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-$26.00
45% no ratio	26.50
48% no ratio	29.00-30.00
50% no ratio	29.50-30.50
Brazilian—nominal	
44% 2.5:1 lump	$33.65
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb, Mo., cont., Mines	$0.90

WAREHOUSE STEEL PRICES

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga. and Heavier*	C.R. 15 Ga.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York (city)	5.80‡	6.51	7.10	5.82	...	5.77	6.56	8.28	5.53	5.85	7.36
New York(c'try)	5.60‡	6.31	6.90	5.62	...	5.57	6.36	8.08	5.33	5.65	7.16
Boston (city) ..	5.70	6.70**	7.11	5.75	...	5.67	6.42	8.72	5.57	5.90	7.40
Boston (c'try) .	5.55	6.55**	6.96	5.60	...	5.52	6.27	8.57	5.42	5.75	7.25
Phila. (city)...	5.80	6.39	6.73	5.55	...	5.55	6.09	8.00	5.25	5.50	6.70
Phila. (c'try) ..	5.65	6.24	6.58	5.40	...	5.40	5.94	7.85	5.10	5.35	6.55
Balt. (city)....	5.46	6.36	6.81	5.52	...	5.57	6.31	...	5.51	5.71	7.16
Balt. (c'try)...	5.31	6.21	6.66	5.37	...	5.42	6.16	...	5.36	5.56	7.01
Norfolk, Va. ..	5.80‡	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse).	6.07‡	...	...	5.83	...	5.88	6.62	...	5.82	6.02	7.47
Buffalo (del.)..	5.00‡	5.90	7.57	5.39	6.42	5.10	5.60	10.13	5.15	5.50	7.06
Buffalo (w'hse)	4.85‡	5.75	7.42	5.24	6.27	4.95	5.40	9.60	5.00	5.35	6.91
Pitts. (w'hse)..	4.85	5.75**	6.80	5.00	6.00	4.90	5.40	9.20††	4.90	5.05	6.55
Detroit (w'hse)	5.32	6.22[4]*	7.35	5.42	6.42-6.73	5.48	5.90	8.44-8.59	5.48	5.67	7.02
Cleveland (del.)	5.00	5.90	6.80-6.85	5.15-5.18	6.15	5.15-5.16	5.60	7.84-8.00	5.15-5.16	5.35-5.36	6.80-6.81
Cleve. (w'hse).	4.85	5.75	6.65-6.70	5.00-5.03	6.00	5.00-5.01	5.45	7.84-7.85	5.00-5.01	5.20-5.21	6.65-6.66
Cincin. (w'hse).	5.26‡	5.94**	6.83	5.38	6.10	5.43	5.94	...	5.43	5.63	7.03
Chicago (city) .	5.00-5.20‡	5.90[4]	6.95	5.00	6.67-6.83	5.05	5.60	7.85[5]	5.05	5.25	6.70
Chicago (w'hse)	4.85-5.05‡	5.75[4]	6.80	4.85	6.52-6.68	4.90	5.40	7.70[6]	4.90	5.10	6.55
Milwaukee(city)	5.18-5.38‡	6.08[4]	7.13	5.18	6.82-7.01	5.23	5.78	8.03[5]	5.23	5.43	6.88
St. Louis (del.)	5.37	6.27[4]	7.44	5.34	6.64	5.39	6.19[6]	6.64	5.39	5.59	7.04
St. L. (w'hse)..	5.22	6.12[4]	7.29	5.19	6.49	5.24	6.04[6]	6.49	5.24	5.44	6.89
Birm'ham (city)	5.00	5.90	6.55	5.00	...	5.00	6.83	...	5.05	5.25	7.69
Birm'ham(c'try)	4.85	5.75	6.40	4.85	...	4.85	6.68	...	4.90	5.10	7.54
Omaha, Nebr...	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Los Ang. (city)	6.60	8.05**	7.95	6.80	9.50	6.25	8.20	...	6.10	6.30	8.20
L. A. (w'hse)..	6.45	7.90**	7.80	6.65	9.35	6.10	8.05	...	5.95	6.15	8.05
San Francisco..	6.15[10]	7.50[2]	8.10	6.75[10]	8.25[8]	5.90[10]	7.55	10.85[2]	5.90	6.35	8.10
Seattle-Tacoma.	6.70[2]‡	9.15[2]	8.80	6.70[7]	...	6.20[7]	8.15[1]	10.35	6.30[7]	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; ** 17 gage; ††as annealed.

Base quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 1000 lb and over; galvanized sheets, 450 lb to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 1499 lb; [4]—400 to 1499 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—300 to 9999 lb; [8]—1500 to 1999 lb; [9]—400 to 3999 lb; [10]—400 lb and over; [11]—500 to 1499lb.

PRICES OF LEADING FERROALLOY PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, c.l., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%. C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lot 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 18.5c per lb of contained Si; packed 19.90-21.70c; ton lot 21.00-22.60c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.
75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.
90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe.) C.l., lump, bulk, regular 19.0c per lb of Si c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.40c per lb of alloy, ton lots packed 8.80c, 200 to 1999 lb 9.15c, smaller lots 9.65c. Delivered. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.
(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

(*Please turn to page 170*)

Pick Up in Metal Sales Continues

Increased demand supports higher prices for copper and and lead. Zinc market also strengthens, but prospects of upward revision clouded by steel labor developments

New York — Metalworking companies continued to buy substantial tonnages of nonferrous metals last week, indicating that a more stable price structure has been attained. Since July 6, when copper advanced 1-cent and marked a halt to the general price decline that had been under way for several months, consumers have displayed an increasingly strong interest in metals.

Consensus in the markets is that stocks of copper, lead and zinc at consuming plants had been allowed to drop below safe working levels and that they are now in urgent need of replenishment. Consumers had withdrawn from the markets originally while they were reducing their high-priced inventories to levels in keeping with their reduced operating schedules; they extended their withdrawal when it appeared they could cover their needs at progressively lower levels by waiting.

A combination of factors finally helped to check the decline. Several mine producers curtailed production, in some instances due to unprofitably low prices and in others to labor difficulties. New supply of metal shrunk further as the result of the steady decline in flow of scrap to custom smelters at the depressed price levels. While these developments were curtailing supplies, the government announced plans to step up purchases of metals for stockpiling.

Although the future trend of prices is dependent to a large degree on developments in the general industrial field, especially the ultimate effects of the steel labor disturbance on the country's economy, a better balance between supply and demand for metals is likely over the balance of this year.

Copper — Electrolytic copper advanced to 17.62½c, delivered Connecticut Valley, on July 11. The market appeared to be on the firmest basis in many months, since metal was offered at that level by a mine producer as well as by custom smelters who previously had "set" the market. A leading seller of lake copper also started quoting at 17.75c, delivered, the first published quotation for that grade since April.

Following the advance in refined copper, all leading fabricators and wire drawers raised prices on their products to the basis of 17.62½c for copper. Red metal scrap prices also advanced last week to higher levels with refiners and ingot makers offering 14.00c to 14.25c for No. 1 copper.

Statistics issued by the Copper Institute revealed that 21,428 tons of refined copper were delivered to the government for stockpiling during June. Total domestic deliveries totaled 45,653 tons compared with 32,566 tons in May, an increase of 13,087 tons. Production of crude copper declined to 63,321 tons from 70,703 tons in May, due mainly to curtailment of operations at mines in various parts of the country. Output from secondary sources dropped further to only 8285 tons from 10,555 tons in May and compared with a peak of 18,190 tons last February.

Production of refined copper declined 6021 tons, amounting to 92,118 tons compared with 98,139 tons in May.

Stocks of copper at refineries increased sharply during June to a total of 166,925 tons, the largest recorded since September, 1940, and an increase of about 38,500 tons over the total reported at the end of May.

Lead — As a result of sustained pressure of consumers for coverage of their lead needs, custom smelters made two advances of ½-cent each last week, bringing the market to 14.00c New York, and 13.80c to 13.85c, St. Louis. Thus, a total increase of two cents a pound has been posted since July 8, bringing the market up to the level that had been maintained by producers. Substantial tonnages of lead were booked at the new level for delivery through August while other business was transacted on an average price basis.

Following the advance in primary lead, manufacturers of lead products, oxides and pigments made proportionate upward revisions in prices of their products.

Zinc — Prime western zinc prices held unchanged last week on the basis of 9.00c, East St. Louis. Undertone of the market strengthened, however, due to a heavy influx of inquiries. Demands for zinc were made by various companies in all classes of consuming industries; some of these firms had been out of the market since the first of the year. Market observers are awaiting the outcome of present unsettlement in the steel industry, since a sharp and prolonged curtailment in galvanizing operations would nullify the improvement which has been made to date in the slab zinc market.

Tin—Stocks of tin held by the Reconstruction Finance Corp. as of June 30 totaled 33,704 tons, an increase of 9382 tons for the first half of the year. This is in addition to some 54,500 tons which are believed to be in the government's permanent stockpile. Receipts in June totaled 7086 gross tons, including 4080 tons from imports and 3006 tons from smelter output. Allocations totaled 2863 tons, or 567 tons above those for May and 2131 tons less than in June, 1948. Total allocations for the first six months amounted to 19,150 tons compared with 30,550 tons in the like 1948 period.

Output of refined tin by the Longhorn smelter held practically unchanged during June at 3006 tons compared with May and showed a drop from June, 1948, when 3650 tons were produced. This brought the total for the first six months to 18,479 tons compared with 18,440 tons in the like 1948 period and 17,366 tons in 1947, according to statistics issued by the Office of Domestic Commerce.

Alcoa Trial Postponed

Pittsburgh—Presentation of Aluminum Co. of America's defense against antitrust charges has been postponed until next fall because of illness of the trial judge, John C. Knox, according to the Alcoa *Aluminum News-Letter*. The trial had been reopened before Judge Knox in the United States District Court for the southern district of New York.

Government attorneys had rested their case and company attorneys had completed about two-thirds of their presentation when Judge Knox became ill. This necessitated postponement of the case until the October term of the court.

Begun in April, 1937, at that time Alcoa was charged with monopolization of interstate commerce in no less than 16 markets and commodities. Approximately 140 charges were brought against the company. Court decisions cleared Alcoa of all save monopoly of the ingot market prior to 1940. The company, in view of postwar developments, has sought a final decision on that charge. Among the developments has been the government's disposal of war-built aluminum plants.

It is estimated Alcoa has facilities to make about 50 per cent of the primary aluminum in this country. The government no longer contends that Alcoa has an ingot monopoly. However, it denies competition conditions have been restored in the industry. It seeks a decision that will compel Alcoa to divest itself of some of its properties.

Metal Prices Cut in Britain

London—Effective as of July 12, Ministry of Supply reduced metal prices to the following levels: Electrolytic copper, £104 (down £13 10s); good soft lead, £75 10s (down £6 10s); prime western zinc, £58 (down £20). The Ministry's buying price for wrought copper is reduced to £70.

Domestic price for antimony was reduced by $160 for 99.6 per cent metal to $680 per ton; for 99 per cent metal, to $640 per ton. Crude antimony of 70 per cent purity was lowered by $140 to $520 per ton.

Phelps Dodge Cable Prices

New York—Phelps Dodge Copper Products Corp. has issued for the first time a new price list covering paper insulated leaded power cables. This list covers the full range of voltages and conductor sizes for solid insulating types as well as three-conductor low-pressure gas filled cables.

The company also has advanced its prices for copper wire to conform to a price of 17.62½c for refined metal.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic 17.62½c, Conn. Valley; Lake, 17.75c., Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 14.25-16.00c; 88-10-2 (No. 215) 24.00c; 80-10-10 (No. 305) 20.50c; No. 1 yellow (No. 405) 12.00-13.75c.

Zinc: Prime western 9.00c, brass special 9.25c, intermediate 9.50c, East St. Louis; high grade 10.00c, delivered.

Lead: Common 13.80-13.85c; chemical, 13.90c; corroding, 13.90-13.95c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

Secondary Aluminum: Piston alloys 15.50-15.75c; No. 12 foundry alloy (No. 2 grade) 14.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 15.50-15.75c; grade 2, 14.50-14.75c; grade 3, 13.50-13.75c; grade 4, 12.50-12.75c. Prices include freight at carload rate up to 75 cents per 100 lb. 5% titanium-aluminum alloy No. 1 (low Cu) 31.00c; No. 2 (2% Cu) 28.00c, f.o.b. Eddystone, Pa.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 38.50c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 39.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $79-$83 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.15.

Cobalt: 97-98%, $1.80 per lb for 550 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 71.50c per ounce.

Platinum: $69-$72 per ounce.

Palladium: $24 per troy ounce.

Iridium: $100-$110 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; based on 16-cent copper.)

Sheet: Copper 31.30; yellow brass 27.85; commercial bronze, 95%, 31.23; 90%, 30.74; red brass, 85%, 29.74; 80%, 29.27; best quality, 28.73; nickel silver, 18%, 41.57; phosphor-bronze, grade A, 5%, 50.47.

Rods: Copper, hot rolled 27.15; cold drawn 28.40; yellow brass, free cutting, 22.37; commercial bronze, 95% 30.92; 90% 30.43; red brass 85% 29.43; 80% 28.96.

Seamless Tubing: Copper 31.34, yellow brass 30.86; commercial bronze 90% 33.40; red brass 85% 32.65; 80% 32.18.

Wire: Yellow brass 28.14; commercial bronze, 95% 31.52; 90% 31.03; red brass, 85% 30.03; 80% 29.56; best quality brass 29.02.

Copper Wire: Bare soft, f.o.b., eastern mills, 100,000 lb lots, 23.42½, l.c.l. 24.05, c.l. 23.55; weatherproof, f.o.b. eastern mills, 100,000 lb lots, 25.193, l.c.l. 25.943, c.l. 25.443; magnet, delivered, c.l. 27.62½, 15,000 lb or more 27.87½, l.c.l. 28.37½.

ALUMINUM

Sheets and Circles: 2s and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	—Hexagonal— R317-T4	—Hexagonal— 17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	..	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $18.50 per cwt; add 50c per cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $18.50 per cwt. Traps and Bends: List price plus 48%.

ZINC

Sheets, 14.00c, f.o.b. mill, 36,000 lb and over, Ribbon zinc in coils, 13.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 12.00c; over 12-in., 13.00c.

NICKEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9%, flake, f.o.b. Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat untrimmed 26.34c; oval 25.34; cast 25.37c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 48.00c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,900 lb, 17.00c, f.o.b. Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 26.25c; over 250 lb, 25.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbl, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c, f.o.b. Sewaren, N. J. On 100 or 350 lb drums only, 100 to 600 lb, 63.3c; 700 to 1900 lb, 60.9c; 2000 to 9900 lb, 59.1c; 10,000 lb and over, 58.00c, f.o.b. Carteret, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100-lb drums 42.50c, f.o.b. Cleveland; 43.00c, Detroit; 42.00c, Philadelphia.

Stannous Sulphate: Less than 2000 lb in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, 97.00c; 100 lb kegs, 98.00c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	14.62½	14.62½	13.87½
Yellow brass	11.50	11.25	10.62½
Commercial Bronze			
95%	13.75	13.50	13.00
90%	13.25	13.00	12.50
Red Brass			
85%	13.12½	12.87½	12.37½
80%	12.75	12.50	12.00
Best Quality (71-80%)	12.75	12.50	12.00
Muntz Metal	10.75	10.50	10.00
Nickel, silver, 10%	13.62½	13.37½	6.81¼
Phos. bronze, A	16.50	16.25	15.25
Naval brass	11.25	11.00	10.50
Manganese bronze	11.25	11.00	10.37½

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, f.o.b. shipping point, carload lots)

No. 1 copper 14.00-14.25, No. 2 copper 13.00-13.25, light copper 12.00-12.25, composition red brass 10.50-10.75; radiators 8.75, heavy yellow brass 8.00-8.25.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 14.00-14.25, No. 2 copper 13.00-13.25, light copper 12.00-12.25, refinery brass (60% copper), per dry copper content 11.25-11.50.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and Brass: Heavy copper and wire No. 1 12.25-12.75, No. 2 11.25-11.75, light copper 10.25-10.75, No. 1 composition red brass 9.00-9.25, No. 1 composition turnings 8.75-9.00, mixed brass turnings 5.50-5.75, new brass clippings 10.00-10.50; No. 1 brass rod turnings 7.50-7.75, light brass 5.50-5.75, heavy yellow brass 6.00-6.25, new brass rod ends 7.50-7.75, auto radiators, unsweated 7.25-7.50, cocks and faucets 7.25-7.50, brass pipe 7.25-7.50.

Lead: Heavy 9.00-9.50, battery plates 5.75-6.00, linotype and stereotype 10.25-10.50, electrotype 9.00-9.50, mixed babbitt 11.25-11.75, solder joints, 12.00-12.50.

Zinc: Old zinc 3.00-3.50, new die cast scrap 3.00-3.50, old die cast scrap 2.00.

Tin: No. 1 pewter 52.00-54.00, block tin pipe 70.00-72.00, No. 1 babbitt 40.00-42.00.

Aluminum: Clippings 2S 9.50-10.00, old sheets 5.50-6.00, crankcase 5.50-6.00, borings and turnings 3.00-3.50, pistons, free of struts, 5.50-6.00.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
June Avg.	16.606	11.850	9.548	103.000	17.000	38.500	40.000	71.500
May Avg.	18.045	13.566	11.880	103.000	17.000	38.500	40.000	71.500
Apr. Avg.	21.774	15.017	14.085	103.000	17.000	38.500	40.000	71.500
July 1-5	16.00	11.85	9.00	103.00	17.00	38.50	40.00	71.50
July 6-7	17.00	11.85	9.00	103.00	17.00	38.50	40.00	71.50
July 8-9	17.00	12.85	9.00	103.00	17.00	38.50	40.00	71.50
July 11	17.62½	12.85	9.00	103.00	17.00	38.50	40.00	71.50
July 12	17.62½	13.35	9.00	103.00	17.00	38.50	40.00	71.50
July 13-14	17.62½	13.80-13.85	9.00	103.00	17.00	38.50	40.00	71.50

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt.	$21.00
No. 2 Heavy Melt.	19.00*
No. 1 Busheling.....	21.00*
No. 1 Bundles.....	21.00*
No. 2 Bundles.....	17.00-17.50*
No. 3 Bundles.....	16.50-17.00*
Heavy Turnings	16.50-17.00*
Machine Shop Turnings	12.50-13.00†
Mixed Borings, Turnings	12.50-13.00†
Short Shovel Turnings.	16.50-17.00*
Cast Iron Borings.....	17.00-17.50
Bar Crops and Plate..	21.00-21.50
Low Phos. Steel.....	23.00-23.50

Cast Iron Grades†

No. 1 Cupola Cast.....	22.00-22.50
No. 1 Machinery Cast.	27.00-27.50
Charging Box Cast....	21.00-21.50
Heavy Breakable Cast.	20.00-20.50
Brake Shoe	21.00-21.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Axles	23.50-24.00
Rails, Random Lengths	22.00-22.50‡
Rails, 2 ft and under..	26.00-26.50
Rails, 18 in. and under	27.00-27.50
Railroad Specialties ...	24.00-24.50
Angles, Splice Bars....	23.00-23.50

*Nominal.
‡Brokers' buying prices.
†Crushers' buying prices.

CLEVELAND

Heavy Melt. Steel.....	$14.50-15.50
No. 1 Busheling.....	14.50-15.50
No. 2 Bundles.....	12.50-13.50
Machine Shop Turnings	8.50-9.50
Mixed Borings, Turnings	14.00-14.50
Short Shovel Turnings.	14.00-14.50
Cast Iron Borings.....	14.00-14.50
Bar Crops and Plate...	16.00-17.00
Punchings & Plate Scrap	16.00-17.00
Cut Structurals	17.00-18.00

Cast Iron Grades†

No. 1 Cupola.....	23.50-24.50
Charging Box Cast....	18.50-19.50
Stove Plate	17.50-18.50
Heavy Breakable Cast.	15.50-16.50
Unstripped Motor Blocks	14.50-15.50
Malleable	17.50-18.50
Brake Shoes	16.50-17.00
Clean Auto Cast.....	26.50-27.00
No. 1 Wheels.....	21.50-22.50
Burnt Cast	14.50-15.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00-21.00
R.R. Malleable	20.00-21.00
Rails, 3 ft and under.	27.00-28.00
Rails, Random Lengths	24.00-25.00
Cast Steel	24.00-25.00
Railroad Specialties ...	24.00-25.00
Uncut Tires	23.00
Angles, Splice Bars....	26.00

† Nominal.

VALLEY

Heavy Melt. Steel	$18.50
No. 1 Bundles.....	18.50
No. 2 Bundles.....	15.50
Machine Shop Turnings	10.00-10.50
Short Shovel Turnings.	16.00-17.00
Cast Iron Borings.....	16.00-17.00
Low Phos.	19.50-20.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.50-21.00

MANSFIELD

Machine Shop Turnings	$10.00-10.50
Short Shovel Turnings.	14.00-14.50

CINCINNATI

No. 1 Heavy Melt. Steel	$18.00
No. 2 Heavy Melt. Steel	17.00
No. 1 Busheling.....	17.00
No. 1 Bundles.....	18.00
No. 2 Bundles.....	16.00
Machine Shop Turnings	8.00
Mixed Borings, Turnings	8.00
Short Shovel Turnings.	8.00
Cast Iron Borings....	9.00

Cast Iron Grades

No. 1 Cupola Cast....	27.00
Charging Box Cast....	21.00
Heavy Breakable Cast..	18.00
Stove Plate	15.00
Unstripped Motor Blocks	15.00
Brake Shoes	15.00
Clean Auto Cast	27.00
Drop Broken Cast	28.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
R.R. Malleable	17.00
Rails, Rerolling	21.00
Rails, Random Lengths	19.00
Rails, 18 in. and under	28.00

DETROIT

(Brokers buying prices, f.o.b. shipping point)

No. 1 Bundles.....	$14.50-15.00
No. 2 Bundles.....	11.00-11.50
No. 2 Heavy Melt. Steel	11.50-12.00
No. 1 Busheling.....	14.50-15.00
Machine Shop Turnings	8.00-8.50
Mixed Borings, Turnings	8.00-8.50
Short Shovel Turnings.	9.50-10.00
Cast Iron Borings.....	9.50-10.00
Punchings & Plate Scrap	14.50-15.00

Cast Iron Grades

No. 1 Cupola Cast....	20.00-21.00
Heavy Breakable Cast.	16.00-17.00
Clean Auto Cast.....	20.00-21.00

BUFFALO

No. 1 Heavy Melt. Steel	$19.00-19.50
No. 2 Heavy Melt. Steel	17.00-17.50
No. 1 Bundles.....	17.00-17.50
No. 1 Bushelings.....	17.00-17.50
No. 2 Bundles.....	15.00-15.50
Machine Shop Turnings	10.50-11.00
Mixed Borings, Turnings	10.50-11.00
Cast Iron Borings.....	14.00-14.50
Short Shovelings	14.00-14.50
Low Phos.	19.50-20.50

Cast Iron Grades

No. 1 Cupola.....	22.00-23.00
Mixed Yard	20.00-21.00
Heavy Breakable	17.00-18.00
Malleable	19.00-19.50
Clean Auto Cast.....	22.00-22.50

Railroad scrap

Rails 3 ft. and under..	26.00-27.00
Scrap rails	21.00-22.00
Specialties	24.00-25.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$17.00
No. 2 Heavy Melt. Steel	16.00
No. 1 Busheling.....	17.00
No. 1 Bundles.....	17.00
No. 2 Bundles.....	14.50-15.00
Machine Shop Turnings	10.50-11.00
Short Shovel Turnings.	13.00-13.50
Mixed Borings, Turnings	10.00-10.50
Bar Crop and Plate...	20.00-21.00
Punchings & Plate Scrap	21.00-22.00
Cut Structurals	20.00-21.00
Elec. Furnace Bundles.	17.00
Heavy Turnings	17.00
No. 1 Chemical Borings.	Nom.

Cast Iron Grades

No. 1 Cupola Cast....	24.00
No. 1 Machinery Cast.	26.00-27.00
Charging Box Cast....	23.00-24.00
Heavy Breakable Cast.	23.00-24.00
Unstripped Motor Blocks	18.00-19.00
Clean Auto Cast.....	26.00-27.00
No. 1 Wheels.....	26.00-27.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$11.00-11.50
No. 2 Heavy Melt. Steel	10.00-10.50
No. 1 Busheling.....	10.00-10.50
No. 1 Bundles.....	11.50-12.50
No. 2 Bundles.....	9.00-9.50
No. 3 Bundles.....	nominal
Machine Shop Turnings	4.00
Mixed borings, Turnings	4.00
Short Shovel Turnings.	5.00-6.00
Punchings & Plate Scrap	15.00
Cut Structurals	nominal
Elec. Furnace Bundles.	17.00

Cast Iron Grades

No. 1 Cupola Cast....	19.00-20.00
No. 1 Machinery.....	20.00-21.00
Charging Box Cast....	17.00-17.50
Heavy Breakable.....	17.00-17.50
Unstripped Motor Blocks	nom.
Malleable	nom.

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$12.50-13.00
No. 2 Heavy Melt. Steel	10.50-11.50
No. 1 Bundles.....	12.00-13.00
No. 1 Busheling.....	9.50-10.00
Machine Shop Turnings	5.00-5.50
Mixed Borings, Turnings	4.50-5.00
Short Shovel Turnings.	6.00-6.50
Bar Crops and Plate..	14.00-15.00
Punchings & Plate Scrap	14.00-15.00
Chemical Borings	10.50-11.00

Cast Iron Grades

No 1 Cupola Cast.....	19.00-20.00
Mixed Cast	18.00-19.00
Heavy Breakable Cast.	17.00-18.00
Stove Plate	18.00-19.00
Unstripped Motor Blocks	16.00-17.00

CHICAGO

No. 1 Heavy Melt. Steel	$19.00-20.00
No. 2 Heavy Melt. Steel	17.00-18.00
No. 1 Bundles.....	19.00-20.00
No. 2 Bundles.....	15.00-16.00
No. 3 Bundles.....	12.00-13.00†
Machine Shop Turnings	11.00-12.00
Mixed Borings, Turnings	9.00-10.00
Short Shovel Turnings	13.00-14.00
Cast Iron Borings ...	12.00-13.00
Bar Crops and Plate..	19.00-20.00†
Punchings	19.00-20.00†
Elec. Furnace Bundles.	19.00-20.00†
Heavy Turnings	17.00-18.00
Cut Structurals	20.00-21.00

Cast Iron Grades

No. 1 Cupola Cast.....	29.00-30.00
Clean Auto Cast.....	28.00-29.00
No. 1 Wheels	27.00-28.00

Railroad Scrap

No. 1 R.R. Heavy Melt	20.00-21.00
Malleable	22.00-23.00†
Rails, Rerolling	27.50-28.00
Rails, Random Lengths	22.00-23.00
Rails, 2 ft. and under.	28.00-29.00
Rails, 18 in. and under	29.00-30.00
Railroad Specialties ..	23.00-24.00
Angles, Splice Bars ..	23.00-24.00

†Nominal

ST. LOUIS

No. 1 Heavy Melt, Steel	$18.00-19.00
No. 2 Heavy Melt. Steel	17.00-18.00
Machine Shop Turnings	9.00-11.00
Short Shovel Turnings.	9.00-11.00

Cast Iron Grades

No. 1 Cupola Cast....	24.00-25.00
Charging Box Cast....	20.00-22.00
Heavy Breakable Cast..	19.00-20.00
Brake Shoes	19.00-20.00
Clean Auto Cast	28.00-29.00
Burnt Cast	20.00-21.00

Railroad Scrap

R. R. Malleable.....	19.00-20.00
Rails, Rerolling	25.00-26.00
Rails, Random Lengths	21.00-22.00
Rails, 3 ft. and under.	25.00-26.00
Uncut Tires	18.00-19.00
Angles, Splice Bars....	24.00-25.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$18.00
No. 2 Heavy Melt. Steel	18.00
No. 1 Busheling	18.00
No. 2 Bundles	16.00
No. 3 Bundles	14.00
Machine Shop Turnings	14.00
Mixed Borings, Turnings	15.00
Short Shovel Turnings.	15.00
Cast Iron Borings.....	15.00
Bar Crops and Plate..	25.00-26.00
Cut Structurals	25.00-26.00

Cast Iron Grades

No. 1 Cupola Cast...	33.00-34.00
Stove Plate	30.00-31.00
No. 1 Wheels	30.00-31.00

STEELMAKING SCRAP COMPOSITE

July 16	$19.17
July 9	19.50
June 1949	20.85
June 1948	40.67
June 1944	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00-21.00
R.R. Malleable	nominal
Rails, Rerolling	30.00-32.00
Rails, 3 ft. and under.	31.00-32.00
Angles and Splice Bars	31.00-32.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles....	16.00
Machine Shop Turnings	12.00

Cast Iron Grades

No. 1 Cupola Cast....	25.00-30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Wheels	20.00
Rails, Random Lengths	20.00

SEATTLE

No. 1 Heavy Melt. Steel	$17.00
No. 2 Heavy Melt. Steel	17.00
No. 1 Bushelings.....	15.00
Nos. 1 & 2 Bundles...	15.00
No. 3 Bundles.....	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	22.00
Cut Structurals	22.00
Elec. Furnace Bundles.	25.00

Cast Iron Grades

No. 1 Cupola Cast....	23.00
Heavy Breakable Cast.	17.00
Stove Plate	20.00
Unstripped Motor Blocks	20.00
Malleable	23.00
Brake Shoes	23.00
Clean Auto Cast.....	20.00
No. 1 Wheels.....	22.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	18.00
Railroad Malleable	22.00
Rails, Random Lengths	18.00
Angles and Splice Bars	18.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles...	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	24.00
Electric Furnace Bundles	26.00

Cast Iron Grades

No. 1 Cupola Cast....	27.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Rails, Rerolling	25.00

HAMILTON, ONT.

(Ceiling prices, delivered)

Heavy Melt.	$21.00
No. 1 Bundles.....	21.00
Mechanical Bundles....	19.00
Mixed Steel Scrap	17.00
Mixed Borings, Turnings	15.00
Rails, Remelting	21.00
Rails, Rerolling	24.00
Bushelings	15.00
Bushelings, new factory, prep'd	19.00
Bushelings, new factory, unprep'd	14.00
Short Steel Turnings...	15.00

Cast Iron Grades*

Cast	26.00

* Removed from price control Aug. 9, 1947; quoted on basis of f.o.b. shipping point.

Sheets, Strip . . .

Forward ordering slight except for cold-rolled carbon and galvanized

Sheet Prices, Page 144

New York — Absence of forward buying marks slackening in flat-rolled steel demand, although some mills are into September on cold-rolled carbon and galvanized. Hot-rolled in light gages is still difficult to schedule. Specialties are slow and here also lack of forward buying is apparent. Only easing in automotive buying is on the part of some parts suppliers who have got ahead of assembly schedules and piled up inventories with scattered deferments. Consumers draw on inventories which are being worked off steadily, but more slowly than expected. While wasters and rejects have moved less readily for some time, tonnage has not backed up materially at the mills. One producer is rolling some strip sizes on a bar mill, a prewar practice. Order placement is frequently tied in with delivery.

Boston—While return to some form of basing point selling permitting freight absorption will loosen up distribution by increasing sources of supply, to what extent mills will absorb freight per ton on any given product is conjectural. Until break-even points for various producers are more clearly established, any return to former delivered base practice is likely to be selective. Freights have climbed sharply since this practice was general; hunger of mills for tonnage under competitive selling will be a factor. Meanwhile, users of flat-rolled are buying conservatively, operating off inventories at reduced production rates. While consumption by stampers and other industrial users is shown substantially, deferred tonnage is expected to be released in heavier volume through August and September with some new buying expected.

Cold strip prices are steady at 4.50c, Wallingford and New Haven, Conn., while Stanley Works, New Britain is 4.50c, Pittsburgh, latter producer never going to f.o.b. mill.

Pittsburgh—Some mills have abandoned monthly allotment practice on hot and cold-rolled sheets, but this is not yet true in all instances. Galvanized sheets are the tightest of all sheet and strip items. Return to a more competitive market does not necessarily mean that prewar steel distribution pattern will be adopted, even should Congress authorize freight absorption. Some producing interests would not be in a position to ship to remote points, as in the prewar period, because of the sharp percentage increases in freight rates during the interim which has placed mills in the Pittsburgh area at an additional competitive disadvantage. Should a steel strike not occur sellers anticipate a sharp reduction in specifications from automotive concerns who have stocked heavily as a hedge against a strike.

Philadelphia — Execpting cold-rolled and light gage galvanized sheet, volume is light. Some mills are booked into September on these

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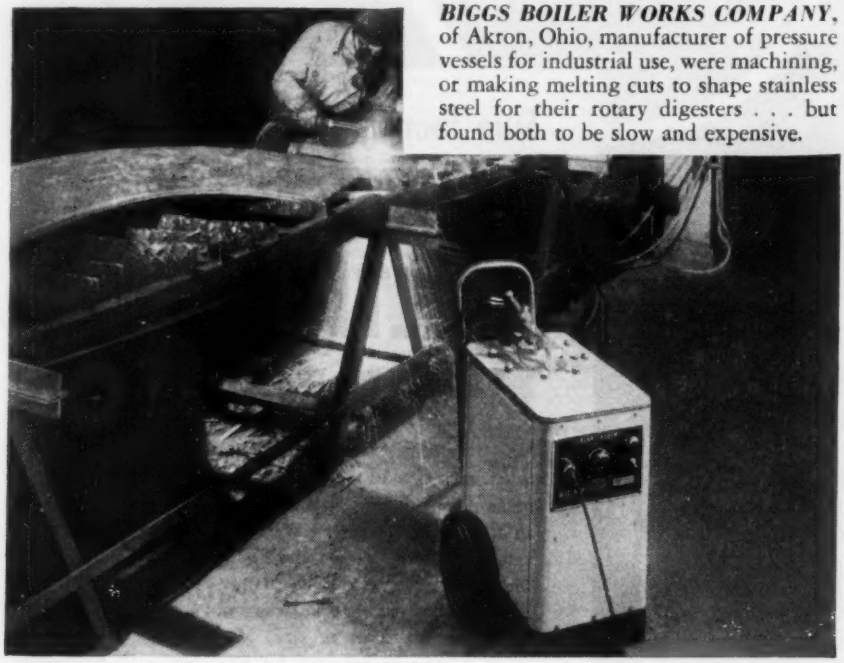
COLUMBIA STEEL COMPANY, SAN FRANCISCO
PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK
USS
MULTIGRIP FLOOR PLATE
UNITED STATES STEEL

Flux-Injection Cutting solves stainless steel fabrication problem



BIGGS BOILER WORKS COMPANY, of Akron, Ohio, manufacturer of pressure vessels for industrial use, were machining, or making melting cuts to shape stainless steel for their rotary digesters . . . but found both to be slow and expensive.

Devere Switzer, Airco technical representative, was asked for his opinion. He suggested a relatively new process — Airco's Flux-Injection method of oxyacetylene cutting stainless steel. The necessary equipment was installed, and after a brief testing period was used on production work. Biggs engineers were well pleased with the results — the smooth cuts were comparable to those obtainable in the gas cutting of mild steel. Further, little machining was required, and the whole operation was speeded up considerably. Moreover, and extremely important from Biggs' viewpoint, it has enabled them to obtain additional orders for the fabrication of stainless steel products.

• • • •

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grades but new buying is light. Contributing to demand for galvanized are allocations for grain bin storage. Automotive requirements lend major support to sheet demand, although scattered suppliers of parts are releasing less tonnage having caught up with assembly schedules as regards finished accessories. Some slack in direct buying of steel by automobile industry is likely by September. Delivery is often factor in placement of new orders.

Cleveland—Suppliers of flat-rolled steel in this district have received a substantial volume of inquiry for September and October delivery. Some consumers have allowed their inventories to deteriorate to dangerous levels and are now making impossible delivery demands on producers. Although one leading producer is almost fully booked for September, another large supplier still can make delivery on hot and cold rolled sheet and strip in that month. These delivery dates will be extended, if the threatened strike at certain mills materializes.

Republic Steel Corp. has revised extras for polishing stainless steel sheets and for boxing and adhesive paper protection for stainless steel products in line with action initiated by Armco Steel Corp.

Cincinnati—Near-balance has been reached in most grades of sheets, and district mills are busy on July schedules. The rate of ordering provides also a favorable outlook for August schedules Heavy requirements for the automotive industry continues to be an important element in sustaining high rate of mill operations. The only supply pinch now is in cold-rolled and galvanized. Sales of stainless are dull.

Chicago—Natural expectations of producers that consumers would press for immediate shipments if the strike outlook darkened were realized last week. Producers and consumers were equally anxious that all possible material be moved out of mills before the end of the week. Aside from this abnormal demand, the longer-term steel picture still has bright aspects. Observers say that while orders continue their downward trend demand from several industries —most of them large sheet tonnage users—is holding up well and that the psychological aspects of the present situation are more responsible for the decline than is an actual reduction in needs. In general, present bookings would indicate a relatively high production rate for sheets and most other flat-rolled products for the coming month and beyond. In some mills galvanized sheets are booked furthest ahead. Some conversion sheets continue to be rolled locally although it is understood that about all of this tonnage will be cleaned up by the end of the month.

Birmingham—Sheet production in the South is well maintained at a rate as near capacity as supply of ingots at finishing mills will permit. The story is an old one, however, since there has not been sufficient sheet tonnage here in years to meet demands. Mills report orders well sustained. Demand for strip is active reflecting needs for the forthcoming harvest season.

Los Angeles—Sheet consumers—

both fabricators and jobbers—have good inventories and generally are well prepared to meet contingencies if a strike materializes. Some steel suppliers feel that an upward trend may be in the making, for inquiries have picked up noticeably. Although this would indicate some stiffening in demand, it would not have the added emphasis of being "contra-seasonal," for seasonal influences have never been strongly felt here. Sheet buying for automobile production is holding up well. Most grades of flat-rolled material are in plentiful supply, with mill delivery on standard sheets averaging 45 to 60 days, somewhat less than in previous "normal" years. Plenty of surplus tonnage is available at less than mill price, but the best of surplus offerings in fast-moving items seems to have been absorbed, and odd lots in off-sizes are not finding ready takers even at considerable concessions which have been offered.

San Francisco—Demand for flat-rolled products still is lagging. Buying is chiefly to fill in gaps in inventories, and few consumers show a tendency to expand their lean stockpile positions. Most users remain hopeful of a price cut in coming months, once the wage question is settled.

Plates . . .

Plate Prices, Page 145

Philadelphia—Ability of mills to make plate deliveries varies. While some are in September on sheared plates, others are able to ship within few days. Type of plate buying is contributing to increase in truck shipments and plates are being shipped greater distances by motor vehicle. Demand is light with shipbuilding requirements holding to current levels.

Chicago — Announcement by Peoples Gas Light & Coke Co. to build a 1000-mile, $100 million pipe line starting around Houston and ending near Joliet Ill., highlights the moderately improved plate and pipe supply situation. Construction will probably be done through a newly-formed subsidiary of the company. The line, through use of compressor stations, will equal the capacity of the dual 24 and 26-inch lines now bringing natural gas into the Chicago area.

Birmingham—Mills here are not stocking any plates. This means that output is moving immediately into the market. There is not so wide a margin between supply and demand as there was a few months ago, but plate orders are comfortable and currently on the basis of approximately a quarter in advance. Some slackening off in shipbuilding and repair needs is noted.

Seattle—Plants fabricating plates report no large projects up for figures. Backlogs are not large but there is a good demand for jobs involving tonnages of less than 100 tons each. The immediate outlook is not considered promising.

Puget Sound Sheet Metal Works, Seattle, is fabricating storage tanks, involving 300 tons, for the Olympia Brewing Co., Olympia.

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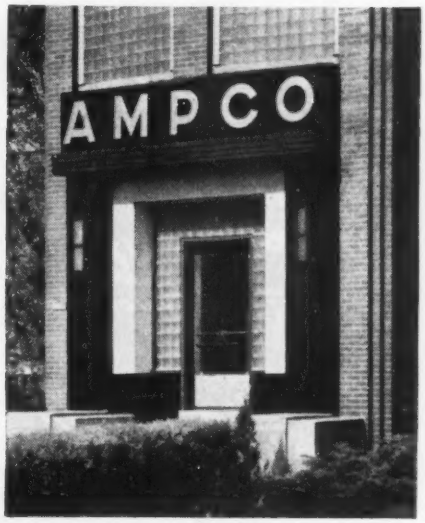

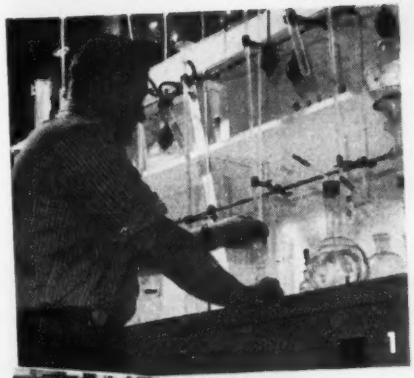
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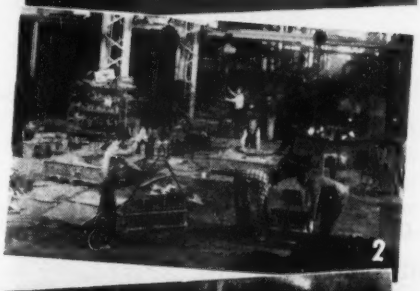
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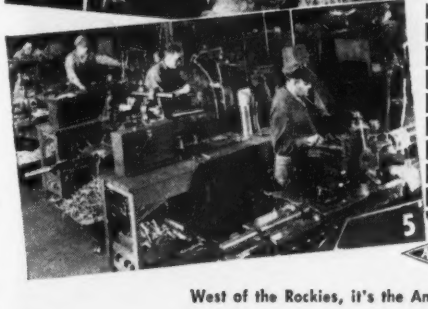
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Steel Bars . . .

Sellers confident new orders for inventory replacement will develop about September

Bar Prices, Page 144

Pittsburgh—Sellers are confident that new orders for inventory replacement will develop in September or early fourth quarter. Consumption remains well above current rate of incoming order volume indicating metalworking concerns are attempting to further reduce inventories to more realistic levels. A few instances are reported of consumers ordering to balance out inventories, but in general consumers' stocks are still too high in relation to current production schedules. Merchant carbon bar delivery from the mills is available within three to four weeks; to meet special conditions even prompter shipment is possible. Demand from automotive sources remains well sustained although there are some signs this customer group may be forced to reduce production schedules later this year. Farm implement companies are less optimistic about continued high level operations over remainder of this year. Forge shops have been relatively inactive for weeks, but some expect mild pick up in operations by fourth quarter.

Boston—Of standard carbon products, bar inventories are relatively heavier than the average which is reflected in listless buying with nearest delivery a factor in placing limited spot orders. Mill schedules for August are peppered with openings; although some deferred tonnage will be released next month, consumers in other instances will hold off until September. Although a diversified product, bar consumption is off in all major lines. Cold-finished bars are available from stock while carbon bar deliveries are possible in two to three weeks with slight attention given normal lead-time.

New York—With consumers drawing on inventory and buying fill-in requirements for most part, August schedules for carbon bars are filling slowly. Cold-drawn stock is available from stock in good range of sizes and output at more cold finishing departments is lower. Cancellations and order revisions have largely subsided and what tonnage remains on books covers firm commitments. Alloy demand continues to drag with deliveries from two to three weeks. Current trend in buying ignores normal leadtime scheduling.

Philadelphia—Buying is slack and confined to fill-in tonnage. Most bar consuming industries are operating at reduced schedules and cold-finished is available from mill stocks. Operations by cold-finishing mills are lower while demand for alloys continues in doldrums.

Chicago—How long a time nonintegrated bar producers could maintain production if basic producers are closed by strike was a matter of much conjecture last week. Several bar makers who have United Steelworkers contracts but have been granted a time extension reported that exhaustion of inventory and of material in transit would be fairly

rapid but that stocks might be large enough to tide them over if the indicated strike was not prolonged. However, hopes were high that shutdown of major mills would be averted at the last minute. Meanwhile, demand from the automotive and farm implement industries continued to feature the otherwise quiet but fairly steady nature of consumer requirements.

Los Angeles—Requirements continue to recede, both among farm equipment makers and steel jobbers, who are the largest bar outlets in this district. Offerings of surplus bar inventories by fabricators remain plentiful, and warehouses are picking up substantial tonnages of this material at sacrifice prices. One warehouse itself offered to other jobbers some 2000 tons of surplus flats, rounds, and shapes.

Tubular Goods . . .

Tubular Goods Prices, Page 145

Cleveland—Pipe continues to be the tightest of all steel product classifications. Leading mills can make fairly early delivery on butt weld pipe, in some instances in September, while seamless weld pipe deliveries range through the fourth quarter to the yearend. Electric weld pipe producers generally are booked solidly over the next 18 months. Should the threatened strike materialize, tubular goods supply would tighten immediately.

Los Angeles—Although crude oil prices have been shaved several times this year and output has steadily been reduced, equipment suppliers report good buying from most of the major petroleum producers. Pipe, tanks, separators, and drilling rigs are being specified on a steady, if somewhat reduced scale. Fabricators believe their business with this industry has stabilized at what may be a fairly normal level. On the other hand, a constructor of service stations reports that June was one of the best months in its history.

Shell Oil Co. has a $33,000,000 expansion program underway in its western refining and marketing operations, to be completed this year. Development of foreign oil fields continues, with American Independent Oil Co. and Pacific Western Oil Co. announcing a joint program for exploration and drilling in Saudi Arabia.

San Francisco—Standard Oil Co. of California, through its subsidiary, Salt Lake Pipe Line Co., has called for bids on the first section of the pipeline it plans to lay between Salt Lake City and western Washington State. The first section will stretch 320 miles to Boise, Idaho, and will cost about $6 million. Total cost of the 560-mile line is estimated at $12 million. The Salt Lake-Boise section calls for eight-inch pipe. Diameter of the pipe for the remaining section has not yet been determined.

Seattle—Cast iron pipe agencies report no buying interest, buyers apparently expecting lower prices. Since the recession in general business, contract cancellations have been heavy, adding to the industry's problems.

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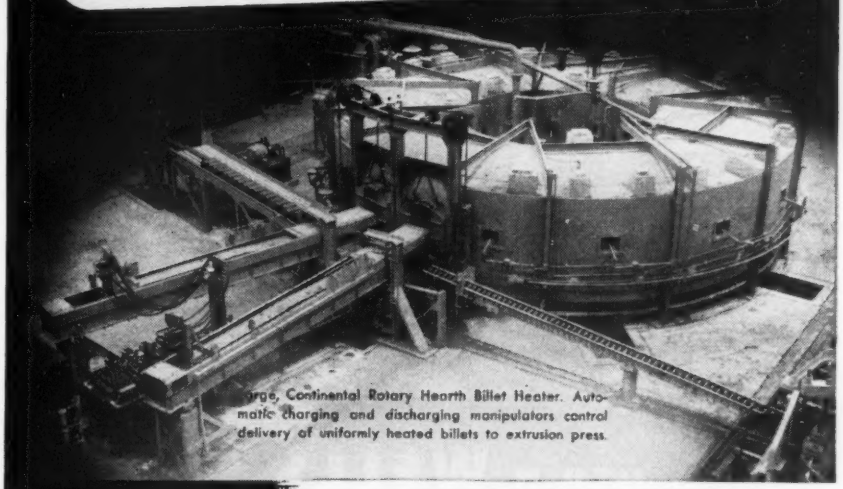

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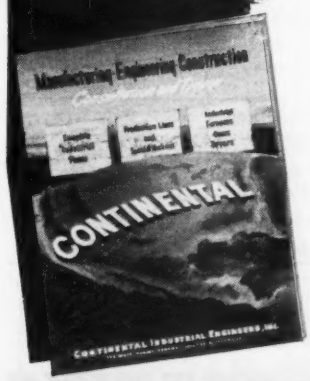

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Wire . . .

Wire Prices, Page 145

Boston—Demand for wire specialties is slow with exception of automotive items, including valve spring wire. Order backlogs are well shaken out and there are openings in August schedules. Processing on numerous types of products in this category takes six to eight weeks. While cutbacks involving wire for automobiles are slight, some parts makers have exceeded assembly schedules and are getting deferments; antifriction bearings, filters and other accessories are affected. Users of clock spring material are buying hand-to-mouth, while razor blade steel demand has gone to pot. Consumers are living off inventories largely and buying fill-in requirments.

Further adjustments in railroad freight rates are necessary to meet truck competition. Rate on rods from Phillipsdale, R. I., to Jamesville, Millbury, and Worcester, Mass., has been reduced to $2.50 per gross ton from $3.09. To permit continuance of plant-to-plant rail movement, freight on rods from Worcester to New Haven has been reduced to $2.12 per gross ton from $2.96; this applies on tracks of the New Haven railroad only on coils to be processed for reshipment from New Haven.

Pittsburgh — Vacation shutdowns will substantially curtail output of manufacturers' and merchant wire products this month, excluding possible steel strike. The producers have been operating primarily on order backlogs which have been practically depleted in recent weeks. This situation naturally has resulted in reduced wire drawing operations in some instances. No improvement in orders for manufacturing wire is noted, while jobbers' inventories of merchant product is at best level for postwar period.

Birmingham—Wire products, while somewhat softer than most of the district's products so far as demand is concerned, continue to move into trade channels at a satisfactory rate. Steel interests indicate little if any stocking of wire products is evident, although hardly as much emphasis is being placed on production as with plates and sheets.

Tin Plate . . .

Tin Plate Prices, Page 145

Pittsburgh—Some improvement in tin plate shipments from stock is noted due primarily to last minute effort of consumers to assure adequate supply should steel strike occur. Sellers have sufficient electrolytic tonnage on books to assure full production schedules through August; hot-dipped bookings are not as heavy. Production schedules beyond August remain obscure, although outlook for electrolytic is more promising than demand for hot-dipped because of recent easing in tin coating and end use regulation. Prospect of dropping export quotas for fourth quarter is expected to largely depend on whether or not there is a steel strike. Trade authorities contend that even should freight absorption be permitted un-

der pending legislation in Congress, it does not necessarily follow that prewar distribution pattern will be followed because of sharp increases in freight rates which have made shipments to some areas prohibitive for Pittsburgh mills.

San Francisco — Reduced demand for tin plate is indicated in plans of California food canners to put up smaller packs of most products this summer. Fruits will be curtailed especially. Heavy inventories of canned goods carried over from last year's pack is a major factor in reducing production this summer. Another deterrent factor for tin plate producers is the Hawaiian longshoremen's strike which is impeding shipments of tinplate to pineapple packers.

Structural Shapes . . .

Structural Shape Prices, Page 145

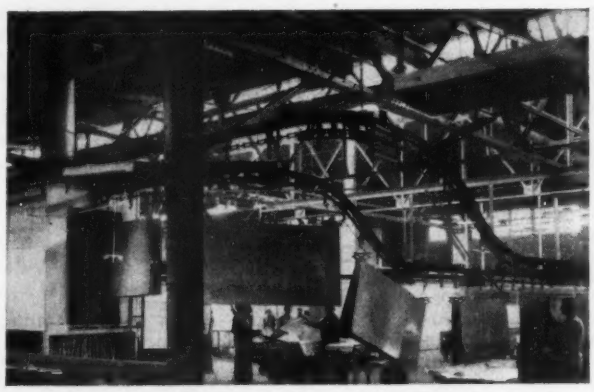
New York—Bids are in on 1500 tons, New York state bridges, with 1000 tons additional included in an opening Aug. 3 at Albany. Closing Aug. 12 with Triborough Bridge and Tunnel Authority is superstructure of pedestrian bridge over Harlem river, connecting East 103rd street Manhattan, with Ward's Island, also substructure and approach ramps under separate contract. Public work thus balances in part decline in private construction. Another 1000 tons is required for domitories, state teachers colleges. Structural mill schedules are not filled for August.

Philadelphia—With plain material available in two to three weeks and in wider range of sizes competition for fabricated contracts is keen and prices are substantially below peak. Private work is slow, but public programs are slowly developing, taking up part of slack.

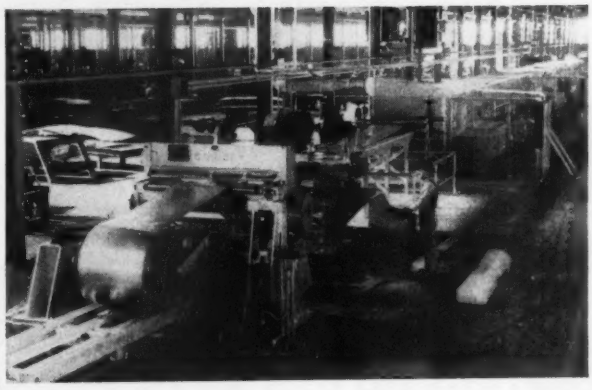
Birmingham—Shape demand is fairly active. Inquiries for some projects which have been revived with a decline in building costs indicate an increasingly active market in the near future. Most observers believe activity will be marked by next spring if the market continues even a moderate decline as far as costs are concerned.

Los Angeles—Intensely competitive conditions rule the structural market. Prices are tight, with all structural items in more than adequate supply, except for small angles and small channels up to 8 inches. Although public construction continues in heavy volume, private building has slackened markedly. However, some industrial jobs now in the planning stage are expected to be released within the next six months. Among them are new western branch plants for several large New England manufacturers.

Seattle—Local fabricating plants have fair backlogs which will carry into the fourth quarter. Meanwhile, no large tonnages have been booked recently. Small jobs are still offering, aggregating a substantial tonnage, demand being for quick delivery. Materials supply presents no difficulty now. Several projects, mainly public works, involving sizable tonnages, are immediately pending.



Alodizing Reynolds *Lifetime* Aluminum sheets, building siding, and refrigerator crisper pans at the Louisville Plant of the Reynolds Metals Company.



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Semifinished Steel . . .

Semifinished Prices, Page 144

Pittsburgh—Supply of semifinished steel items exceeds requirements of nonintegrated steel producers. In most instances, these interests are not taking as much steel as when semifinished supply was inadequate to sustain the record demand noted throughout most of 1948. Open market transactions for rerolling quality ingots are practically nonexistent. Sheet bar quotations continue to decline, being off another $5 to $50-$55 range, but are still too high to make possible profitable operation of the few remaining hand mills in competition with modern continuous mills. Some of these hand mills have been shut down. The question seems to be, how long before growing competitive conditions will force similar action for other units still in operation? A somewhat brighter outlook is held for those hand mills tied-in closely with metal fabricating activities of the same company.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 144

New York—With more tonnage available, inquiry for concrete reinforcing bars is lower, featured by 3000 tons, Farragut Homes, Brooklyn, N. Y., on which bids are in. Bulk of housing projects in this area have been estimated and are under contract. New York state bridges and highways, bid and estimated, including opening of Aug. 3, take close to 1000 tons. Connecticut, buying bulk of reinforcing highway mats directly for this year, will return to including this material in general contract specifications.

Seattle—Local plant of the Bethlehem Pacific Coast Steel Corp. is operating steadily at full capacity. Demand for small lots of less than 100 tons each continues insistent while that for larger tonnages is better than normal. Reports from Portland state mills are extremely busy. Backlogs are heavy, but are being gradually reduced.

Awards pending include 400 tons reinforcing for Washington state road projects, bids July 22, and 300 tons for a Montana state bridge project, general contract awarded. Plant of Northwest Steel Rolling Mills Inc., Seattle, is still idle due to a labor controversy.

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Steel Carloadings To Drop

Washington — National Association of Shippers Advisory Boards, this city, forecasts a decrease of 10.5 per cent in carloadings of iron and steel during the third quarter compared with those for the same quarter last year. This compares with an estimated decrease of 7.4 per cent for all commodities.

Carloadings of iron and steel during the third quarter are estimated at 422,118 compared with 471,512 during the third quarter last year. Estimates of third quarter 1949 carloadings compared with those for the like 1948 period, respectively, by districts are as follows: New England, 4764 and 5540, decrease of 14 per cent; Atlantic states, 9479 and 9248, an increase of 2.5 per cent; Allegheny, 186,407 and 212,793, a decrease of 12.4 per cent; Great Lakes, 48,994 and 56,186, a decrease of 12.8 per cent; Ohio valley, 18,582 and 19,458, a decrease of 4.5 per cent; Midwest, 75,240 and 83,600, a decrease of 10 per cent; Northwest, 1956 and 4032, a decrease of 51.5 per cent; Trans-Missouri-Kansas, 6182 and 7261, a decrease of 14.9 per cent; Southeast, 37,312 and 39,694, a decrease of 6 per cent; Southwest, 9569 and 9113, an increase of 5 per cent; Central-Western, 8915 and 9611, a decrease of 7.2 per cent; Pacific Coast, 13,391 and 13,317, an increase of 0.6 per cent; and Pacific Northwest, 1327 and 1659, a decrease of 20 per cent.

Iron Ore . . .

Iron Ore Prices, Page 146

Cleveland—Shipments of Lake Superior iron ore from the upper lake ports during the week ended July 11 totaled 2,951,236 tons compared with 2,861,457 tons for the preceding week and 2,895,584 tons for the like week a year ago, according to the Lake Superior Iron Ore Association, this city. The average daily loading rate at United States ports was 416,738 tons compared with 398,585 tons for

the preceding week and 410,248 tons for the like 1948 week.

Shipments for the season to July 11 came to 37,559,666 tons compared with 35,067,969 tons for the corresponding 1948 period. Shipments from United States ports alone came to 37,069,308 tons, an increase of 2,413,756 tons over the 34,655,552 tons for the like period a year ago.

Pig Iron . . .

Blast furnace operations continue to drop due to slack demand and threat of steel strike

Pig Iron Prices, Page 146

Pittsburgh—There are some indications that foundries producing plumbing ware fixtures may be able to either resume operations or step up production schedules within the near future. Considerable progress has been made in working down excessive inventories of finished products. American Radiator & Standard Sanitary Mfg. Corp. states, for example, that current volume of new orders exceeds present output. When companies' inventories of finished products are reduced to more realistic levels a gradual resumption to more normal operations will occur. Prospect of blast furnace shut down resulting from a steel strike has prompted some consumers to reenter the market for the first time in months. Substantial reduction in pig iron requirements of integrated steel producers, has forced shutdown of 13 of 47 blast furnaces in the Pittsburgh area. This represents lowest level of pig iron output since prewar period, excluding coal and steel strikes.

Boston—Slight improvement in pig iron releases following vacation periods may be reflected in August shipments, but any improvement is likely to be moderate due to heavy inventories still held by large melters. Smaller shops, not having opportunity to build substantial inventories, will furnish most of these releases. Reduction of $2.50 per ton at Everett widens the competitive circle of Mystic with Buffalo and eastern Pennsylvania, but currently price in itself exerts slight influence in buying. Inventories, including finished castings, are the buying bellwether.

Philadelphia—Pig iron shipments are light, at lowest point in years, with indications August will show slight improvement. Consumers in more instances are taking longer vacations than usual and melt is low. Inventories are being reduced slower than expected, notably by larger consumers. Soil pipe business is slow, also cast pipe. Supply of finished castings at some shops is substantial, reducing their iron needs for the immediate future.

Chicago — Rebound from the Fourth of July holiday was registered here by blast furnace operators, several of whom had banked stacks for various periods ranging from the weekend to ten days. By last week all the district's stacks which had operated prior to July 4, with the exception of one, were back on blast. The one which stayed down was furnace No. 8 at South Works of Carnegie-Illinois on which a relining job, originally projected for next month, was begun. Thus, at midweek 38 of the district's 43 furnaces were operating. On Thursday, however, Carnegie-Illinois banked five blast furnaces at Gary and four at South Works in preparation for a strike.

Pressure for iron deliveries to foundries last week brought memories of that during the iron shortage. Foundrymen were seeking at the last minute to build up higher stocks to carry them through a strike period at producers' plants. This pressure, while strong, was eased to some extent by sizable inventories of finished castings which some foundries have built up and may not be called for if a steel strike forces early curtailment of operations in consumers' plants. Some observers now seem positive that gray iron melters are at the low point in the demand cycle and that even if business generally should coast along or decline gradually, further reordering of castings in quantity is inescapable.

Cleveland—Foundries are operating at an average of only about 35 per cent of capacity in this district. As expected, July has developed into the slowest month of the year to date and it probably will mark the low

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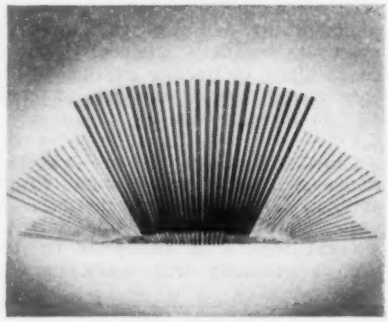

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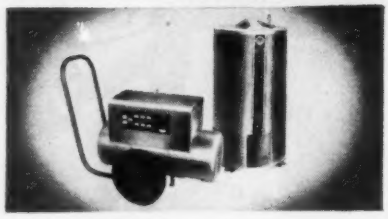

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point for 1949. So far there has been no indication of a pickup in buying. Some interests, especially those supplying castings for the automotive, heating and air conditioning industries, are still operating at a high rate. These consumers did a little covering as a hedge against the possibility of a steelworkers strike, but the aggregate tonnage involved was not enough to offset the drop in requirements from other sources which have light orders booked or are closed down for vacations. Prices remain unchanged on the basis of $46, furnace, for basic.

Buffalo—District pig iron operations plunged 12 points to 69.5 per cent of capacity during the week as Republic Steel Corp. and Hanna Furnace Corp. each dropped a furnace. This left 11 out of 16 furnaces on the active list. The Hanna unit was on merchant iron while Republic was rotating its unit on merchant and basic as the demand required. A further falling off in foundry demand for iron was blamed for the latest cutback in production. While the ore fleet is operating at a near record pace, a number of operators have shifted their carriers to the grain trade.

While rumblings continue over the possibility of an additional reduction in pig iron prices, no appreciable demand for a cut has been made by foundries. On the contrary, casters point out they might stand to lose if iron prices are cut. It would mean a move among foundries' customers for lower prices on castings. Some melters point out that the forced drop in castings prices might be bigger than any on iron.

Cincinnati—Market for pig iron in this district continues extremely dull in reflection of the light melt. Most foundry operations have been cut to two or three days, and meanwhile, some melters are shut down for prolonged vacations.

Birmingham—Slight improvement in pig iron shipments continues. June shipments were above those of May; those for July thus far have registered a slight improvement over June. Moderately large inventories are gradually being displaced. Foundry vacation schedules have interfered to a considerable extent with revival of demand.

Warehouse . . .

Warehouse Prices, Page 147

New York—Demand for steel from warehouse this month will be lowest since before the war due to vacations and plant closings. Most volume is with smaller consumers for hand-to-mouth fill-ins, larger users operating off inventory. Warehouse stocks are becoming balanced and placements with mills reflect trend in secondary distribution. Warehouses, confronted with scattered price shading, are price sensitive and with mill deliveries reasonably prompt on most products, forward commitments are limited.

Philadelphia — Distributors have followed mills in reduction of polished stainless sheets, involving a reduction in extras approximating 30 per cent. Demand for steel from

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warehouses is at low ebb with indications July will be slowest month in recent years. This trend is reflected in warehouse buying, and forward orders with mills are light. Buying is confined largely to spot fill-in needs with warehouse stocks well balanced, both for carbon and alloy products.

Pittsburgh—Steel distributors noted little change in day-to-day shipments from stock throughout June. Mass vacations among metalworking companies this month is expected to result in substantial reduction in warehouse shipments from the June level. However, distributors are confident of an up-turn in demand during August, reflecting better balanced inventories among consumers. Distributors' stocks are more than ample to serve current requirements with possible exceptions of galvanized sheets, wide flange beams and standard pipe.

Cleveland—Increase in inquiry for warehouse steel has been spotty. Some customers have requested upward revisions in their orders to replenish stocks, partly as a precautionary measure in view of the possibility of a steel strike within the near future. Warehouses are not too well prepared to weather a shutdown at the mills, especially if customers come into the market for mill quantities. Cold-rolled sheets and galvanized sheets are still rather difficult to obtain under 60 days. In contrast, cold-finished bars can be had on overnight delivery from most distributors. Delivery on the bulk of other warehouse items ranges from a few days to two weeks. Prices held unchanged last week.

Cincinnati—Sales volume of district warehouses is fairly steady at the reduced levels established in recent months. New ordering continues to be affected by inventories still held by fabricators, with sales of steel currently being on a hand-to-mouth basis. Seasonal curtailments and vacations are also factors in reduced demands.

Los Angeles—Steel jobbers report more inquiries and somewhat more buying, although they are inclined to attribute much of this to consumers who have pretty well used up their inventory and are pondering the effects of a steel strike. Only galvanized now remains in short supply, although in heavier gages it is more plentiful than in prewar days. A substantial portion of jobbers' receipts currently is in the form of surplus tonnage picked up at less than mill prices, with such material occasionally being acquired from other warehouses.

Seattle — Jobbing houses report turnover this month larger than in June. Construction projects have stimulated business, the larger shops being busy, the smaller plants operating only part time. Orders for galvanized sheets are not being made as quickly as expected, being 30 to 45 days behind schedule; hot rolled sheets are in a slightly better position. Consequently, wholesalers do not expect to have complete stocks until the end of this quarter. Scarcity of these items is a continued handicap.

Scrap . . .

Two mills embargo scrap shipments. Dealers reluctant to offer scrap at present prices

Scrap Prices, Page 150

Chicago—With an embargo placed on scrap shipments by at least two district mills in midweek and others temporarily out of the scrap market, steelmaking scrap prices for the most part remained unchanged and nominal. Tone of the market, instead of weakening as might have been expected because of the limited number of mills which will continue to need scrap in event of a selective strike, was apparently stronger, thinking in scrap circles being that the need for purchased scrap would be somewhat greater after the labor dispute is resolved. Logic behind this is that mills, if struck, would not make home scrap, metalworking plants would in turn reduce their scrap generation and when dispute is settled several mills may come into the market simultaneously. Upshot is that both dealers and brokers last week appeared extremely reluctant to offer scrap at present prices. To be sure, some distress tonnage, with destinations blocked by the embargo, will probably be dumped, but on the

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whole the trade looks for a strengthened market.

Demand for cast grades has gradually mounted, and last week price of No. 1 cupola cast was quotable at $29-$30, clean auto cast was bringing $28-$29, while No. 1 wheels remained stable at $27-$28. Bids received on three railroad lists recently substantiated the previously quoted prices for these items, and the number of bidders for this material was understood to have increased over previous offerings.

Cleveland — Undertone of the scrap market weakened last week as the threat of a steel strike became more ominous. Some mills requested immediate hold-up of shipments on old contracts and, of course, made no new commitments. This indicates that material will start accumulating rapidly at dealers' yards which will result in lower prices at that level. Due to absence of new contracts, prices were nominally unchanged last week on the basis of $14.50 to $15.50 for No. 1 heavy melting. Regardless of developments on the labor front, consensus among dealers and brokers is that the movement of scrap between now and Labor Day will be slow and that prices probably will drift downward.

Pittsburgh—Activity in scrap market transactions reached low ebb last week because of the threatened steel strike. Scrap inventories among major producers have been at near record levels in recent weeks due primarily to curtailment in ingot operations and greater availability of pig iron. These two factors have more than offset the decline in dealer scrap activity in recent months.

Dealer open-hearth scrap grades continue to be quoted on a nominal basis. Crushers have reduced offering price on machine shop turnings and mixed borings to a range of $12.50-$13. Should a steel strike of relatively long duration develop, prices for cast iron scrap will probably advance somewhat. Railroad scrap prices remained unchanged during the week.

Philadelphia—Prices for most part are unchanged with buying at standstill. There are few outstanding orders to be filled and these will be out of the way shortly. Incoming volume at yards is small at current low price levels and bulk of melting is done with industrial scrap, production of which is also down. Cast grades are slow with many shops on vacation.

Buffalo—Quiet weakness fell over the scrap market last week as talk of a steel strike prevailed in trading circles. The search for buying interest brought little results. Vacations and lower ingot rates also were reflected in the lack of bids. Dealers reported there were no immediate indications that the situation was due for a change.

Dealers have pared yard prices. While some industrial suppliers of scrap complained about the slump in prices, material from these sources was reported moving according to schedule. Dealers, too, were apprehensive over the possibility of moving material in the current market.

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scrap market is dull with consumers awaiting developments on the labor front. New buying of open-hearth material is absent from this district, and foundry operations are so low needs are extremely light. Prices are nominal and without test. Desultory sales have brought a $2 decrease in drop broken cast and short rails. Market interests fail to foresee any signs of a pickup in scrap demand inside 60 days.

Birmingham—Scrap market continues dormant with price structure having little current meaning. Heavy melting unchanged at $18, has moved in limited quantity with the largest users buying only an occasional small tonnage.

Los Angeles—Scrap requirements remain very low with mills becoming increasingly selective and taking virtually no baled material. Although prices are unchanged this month, and have not yet followed the latest reduction in other districts, some observers anticipate a downward adjustment in August. Dealers are hard-pressed by declining volume and sliding prices on the one hand, and a strike of yard workers on the other. As a result, several good-sized yards here are reportedly going out of business. Although some foreign material continues to come in under old commitments, no new arrangements are being made for offshore supplies.

San Francisco—Mills are buying virtually no scrap. Current prices are purely nominal. With operations at many mills declining steadily, no boost for the scrap market is in sight.

Seattle—Steel scrap situation is satisfactory from a mill standpoint. Sufficient receipts for current consumption are being received, prices unchanged. Inventories are static as buyers do not wish to hold large backlogs under present conditions.

Canada . . .

Toronto, Ont. — Demand for iron and steel in the Canadian markets is holding at a steady level, but there has been considerable easing in the supply situation in the past month or six weeks, largely due to increased imports from the United States. At present, the only material in short supply is galvanized sheets. While supplies are easier, demand for Canadian produced steel continues well in excess of supply and it is not expected that supply and demand will come into balance until some time in last quarter, and this depends largely on importations from the States.

With the exception of galvanized sheets which were reduced $3 per ton to $5.90 per 100 pounds, no change has been made in Canadian steel prices which are being maintained at government ceiling. The reduction in galvanized sheets is credited to the drop in the zinc price. Steel interests here do not look for further advances in steel price when controls are removed, but at the same time there is no indication of price cutting.

Demand for carbon steel bars is holding at a good level and mills in this country are being pushed to keep customers supplied, however,

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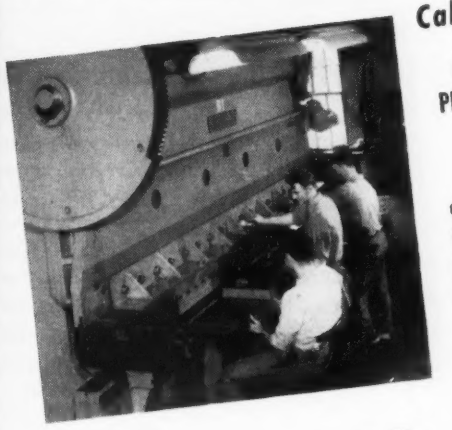

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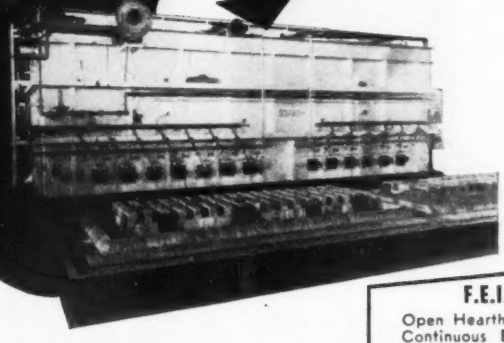

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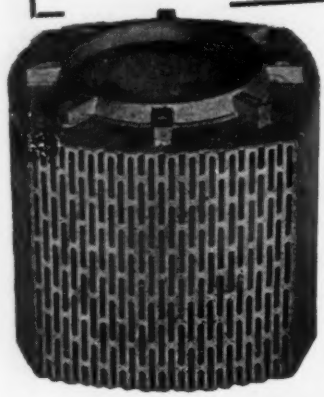

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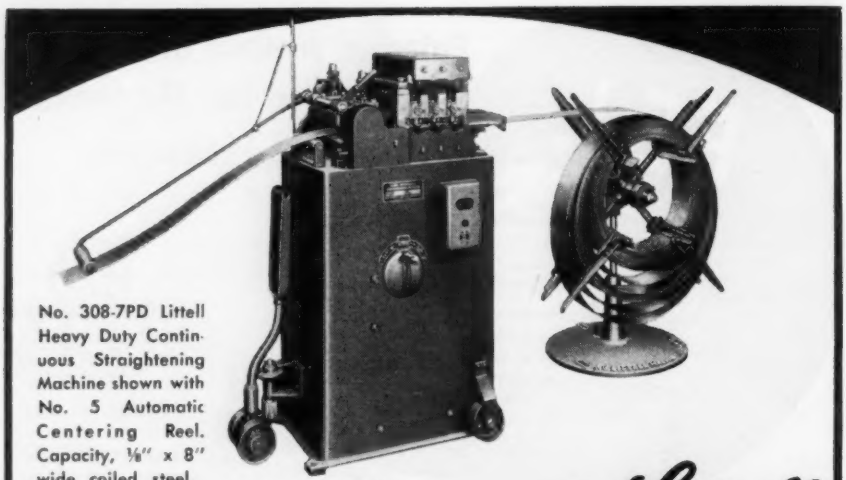

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imports are relieving some of the pressure.

There is evidence of easing in demand for black sheets and it is understood that quotas are being increased.

Steel plate is in good demand with supplies in better volume from domestic producers. However, larger tonnages of imports are required to meet all needs.

Wire and nails are becoming more plentiful and supplies again are to be seen in retail stores. The betterment in nail supply also is credited to the fact that some large shipments have arrived from the United States recently.

Merchant pig iron sales are holding around 8000 tons weekly and melters are finding less difficulty in obtaining iron. However, surp'us stocks are limited. No actual shortage is reported.

Steel mills in the Hamilton district have taken direct action to cut scrap prices and have knocked down the entire list of steel grades $2 per ton below ceiling. It is understood that this move brings steel scrap prices more in line with prevailing United States prices. Scrap supply also is improving and mills now are in position to obtain all they require, either from domestic sources or through importations. Larger tonnages of scrap now are reaching Canada from across the line. Dealers also have dropped the price of cast scrap which now is selling at $25-$26 per gross ton.

J & H Boosts Aviation Backlog

JACK & Heintz Precision Industries Inc., Bedford, O., increased its backlog of orders in June when it received more than $1.5 million in additional contracts for aviation equipment. This brings the company backlog of aviation business to over $6 million, with deliveries extending over a period of eight months.

Westinghouse Cuts Iron Prices

PRICE CUTS of 33 1/3 per cent on two electric irons no longer in production were announced by Westinghouse at the opening of a housewares show in Atlantic City, N. J. Cuts were effective July 15. The company also announced cuts in the next two weeks on roasters and broiler grids which will sell for the price of the roaster alone, $39.95.

Pennsylvania Recalls Employees

INCREASED demand for locomotives, cars and service is prompting Pennsylvania Railroad to call back several thousand of 15,000 employees furloughed June 13. At the Altoona, Pa., works about 2000 of 5000 furloughed shop employees are being recalled bringing the force there to about 8000. Back-to-work order is for July 18.

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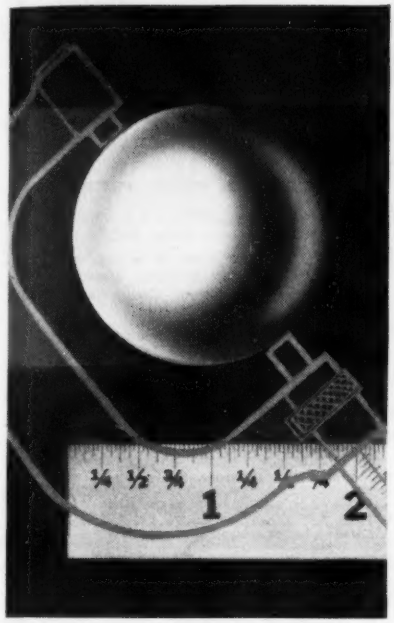

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PLANT EXPANSION for a 40 per cent increase in television set production has been completed by Motorola Inc., Chicago. New facilities more than double floor space of the television plant; they are for a new line of television receivers to be introduced in the fall.

Huge Video Sale Seen by 1950

PRODUCTION and sale of 1.5 million television sets by the industry is anticipated by Allan B. Mills, general sales manager of RCA Victor Home Instrument Department. Estimating that by early 1950 television will represent greater dollar volume than any major electrical appliance, he said decline of interference and greater sensitivity of sets expanded the video market into former "fringe" reception areas.

IBM Introduces 8 New Machines

EIGHT new machines—six electric accounting machines, a device for using the IBM electric typewriter with punched cards and a time recorder—were announced by International Business Machines Corp., New York. Six additional colors have been added to the standard gray of the IBM typewriter, and a new ribbon is available.

June Car Deliveries Down

DOMESTIC freight car deliveries in June totaled 9121, a decline from May total of 9525 cars, according to the American Railway Car Institute. Production of the leading types of cars was: Box 1162; gondolas, 2015; hoppers, 4166; refrigerator, 864; tank, 414.

Of June deliveries, 5805 were from car builders and 3316 from railroad shops.

Orders during June totaled 153, all going to the car builders.

The backlog of orders as of July 1 was: Carbuilders, 22,279; railroad shops, 20,534.

STRUCTURAL SHAPES . . .

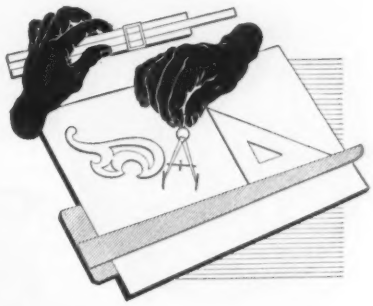
STRUCTURAL STEEL PLACED

600 tons, Wanamaker store, Wilmington, Del., to Belmont Iron Works, Eddystone, Pa.; McShane Construction Co., Philadelphia, general contractor.

513 tons, Iowa state bridge, proj. F88(5), Bremer county, to Clinton Bridge Works for fabrication by Allied Structural Steel Cos., Chicago.

500 tons or more, tainter gates, etc., navigation lock, McNary dam, Columbia river, to United Engineering Co., San Francisco, low, $142,400, by U. S. Engineer.

350 tons, machinery for McNary dam lock, to



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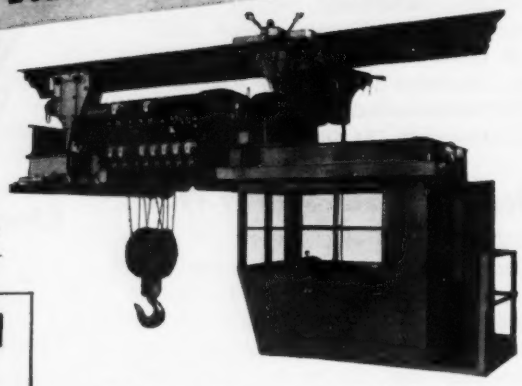

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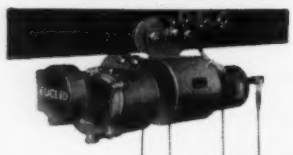

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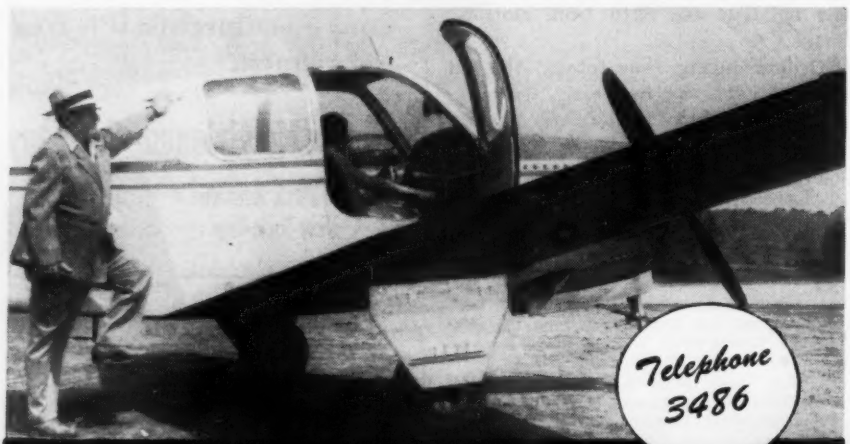

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142 tons, Iowa state bridge, proj. S-1267(1), Greene county, to Pittsburgh-Des Moines Steel Co.

135 tons, hatch covers, spec. 2691, Bureau of Reclamation, Louise, Ariz., to Missouri Valley Steel Inc., Leavenworth, Kans.

130 tons, Nebraska state bridge, proj. F321 (3), Thurston county, to Capital Iron Works Co., Topeka, Kans.

125 tons, state bridge, No. 3112, Rush, Ind., to Midland Structural Steel Co., for fabrication by Allied Structural Steel Cos., Chicago.

110 tons, service building, Fairbanks-Morse & Co., Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

STRUCTURAL STEEL PENDING

2100 tons, factory, Nash-Kelvinator Corp., Kenosha, Wis.; bids taken July 5.

1200 tons, also 200 tons H piling, two Montana state highway bridges, Missouri river; Anderson Construction Co., Great Falls, low.

700 tons, Willamette river state bridge, Eugene, Oreg.; Tom Lillebo, Reedsport, low.

360 tons, penstock and top seal gates, Hungry Horse dam project; bid calls to Bureau of Reclamation out about July 22 and July 27.

232 tons, Illinois state bridge, sec. 0203.1HF, Cook county; bids in.

197 tons, Illinois state bridge, sec. 0303.1HF, Cook county; bids in.

175 tons, Washington state bridge, Snohomish-Island counties; bids to Olympia, July 22.

152 tons, Illinois state bridge, proj. 173, West Salem; bids in.

150 tons, Willamette Creek dam sluice gates; McWalters & Bartlett, Boise, Idaho, low $40,717, to U. S. Engineer, Walla Walla, Wash.

110 tons, miscellaneous fabricated steel, Columbia Basin and Hungry Horse projects; bids to Bureau of Reclamation scheduled for Aug./Sept.

100 tons, bottling plant Columbia Brewery Co., Tacoma; bids in.

Unstated, control bay and other units Coulee power plant; bids to Bureau of Reclamation July 21; spec. No. 2724.

REINFORCING BARS . . .

REINFORCING BARS PLACED

100 tons, miscellaneous construction projects to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

3000 tons, Farragut Homes, Brooklyn, N. Y.; John A. Johnson & Son Co., Brooklyn, low on general contract.

300 tons, two Montana state highway bridges; general contract to Anderson Construction Co., Great Falls, Mont.

135 tons, Washington state bridge, Grant county; bids to Olympia, July 22.

135 tons, Washington state bridge, Snohomish-Island counties; bids to Olympia, July 22.

110 tons, Washington state bridge, Okanogan county; bids to Olympia July 22.

PLATES . . .

PLATES PLACED

200 tons, storage tanks for Olympia Brewing Co., Olympia, Wash., to Puget Sound Sheet Metal Works, Seattle.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Union Railroad, five 1500-hp heavy-duty diesel-electric road switching locomotives, to Baldwin Locomotive Works, Eddystone, Pa.

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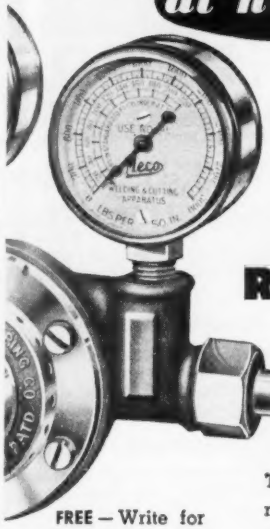

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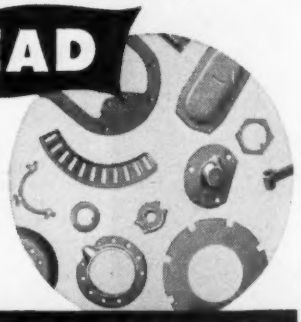

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CONSTRUCTION AND ENTERPRISE

ALABAMA

MOBILE, ALA.—Louisville & Nashville Railroad, C. H. Blackman, chief engineer, 908 W. Broadway, Louisville, will build a $350,000 terminal; plans by J. C. Haly, c/o owner.

ARKANSAS

NORTH LITTLE ROCK, ARK. — Arkansas Farm Bureau Co-operative, c/o Ralph Hudson, Harrison, Ark., will build a $600,000 fertilizer plant; plans by Utility Sales & Engineering Co., Atlanta.

CONNECTICUT

WEST HARTFORD, CONN.—Hartford Electric Light Co., 266 Pearl St., Hartford, Conn., plans to build a $200,000 substation, Frederick Rd.

GEORGIA

ATLANTA—Packard Motor Car Co., 1580 E. Grand Blvd., Detroit, will build a $500,000 warehouse and office; plans by R. A. Strougaard, c/o owner.

IDAHO

LEWISTON, IDAHO—Potlatch Forests Inc. plans to build a $2 million pulp mill.

ILLINOIS

CHICAGO—Central Steel & Wire Co., 3000 W. 51st St., will build a $300,000 plant addition; plans by Friedman Alschuler & Sincere, 223 W. Jackson St.

CHICAGO—Vandercook & Sons, 900 N. Kilpatrick St., has awarded a $200,000 contract to Campbell-Lowrie & Lautermilch Corp., 400 W. Madison St., for construction of a factory; Johnson & Johnson, 111 W. Washington St., architect.

SKOKIE, ILL.—Woodall Industries, 2025 S. Calumet St., Chicago, will build a $300,000 plant; plans by Victor L. Charn, 4744 W. Rice St., Chicago.

INDIANA

INDIANAPOLIS—Omar Inc., 1910 Harney St., Omaha, Nebr., will build a $100,000 warehouse; plans by Luria Engineering Co., engineer and architect, 500 Fifth Ave., New York.

IOWA

DES MOINES, IOWA—Chambers Motor Co., Second & Grand Aves., will build a $100,000 garage and show room.

MT. PLEASANT, IOWA—Southeastern Iowa Co-operative Association plans to build a $100,000 warehouse and garage; Stanley Engineering Co., Hershey Bldg., Muscatine, Iowa, engineer.

KANSAS

WICHITA, KANS.—Hyde Park Dairies Inc., McLean Blvd. & McCormick St., plans to build a $100,000 dairy plant; plans by Overend & Boucher, Brown Bldg.

KENTUCKY

PADUCAH, KY.—Paducah Box & Basket Co. will build a $150,000 plant.

MICHIGAN

BIRMINGHAM, MICH. — Dearborn Motors Corp., 15050 Woodward Ave., Detroit, plans to build a $2.5 million warehouse, laboratory and office; plans by Giffels & Vallet, engineer and architect, 1000 Marquette Bldg., Detroit.

MISSISSIPPI

JACKSON, MISS.—Swift & Co., Chicago, are drafting preliminary plans for reconstruction of a $150,000 wholesale curing and distributing plant recently destroyed by fire; T. W. Trafton, plant manager.

YAZOO CITY, MISS.—Mississippi Chemical

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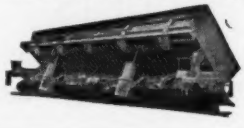

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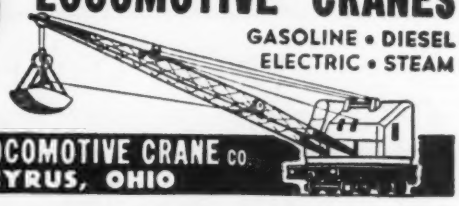

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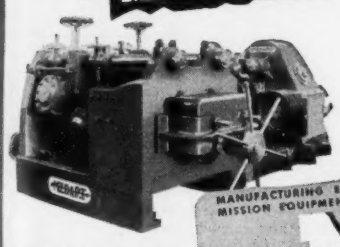

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Corp., Owen Cooper, executive vice president, has final plans in progress for an administration building at the site of the proposed $12 million fertilizer plant project; bids to be called sometime in August; cost of building $60,000; Girdler Corp., Louisville, engineer, Charles H. Dean, architect.

MISSOURI

JOPLIN, MO.—A. Y. MacDonald Mfg. Co., Omaha, Nebr., has awarded a general contract for a $109,000 steel and plate glass warehouse and office to B. & G. Construction Co., 411 E. Sixth St., Carthage, Mo.; Tierney & Brey, Reliance Bldg., Kansas City, Mo., architect.

LEBANON, MO. — City of Lebanon has awarded a contract for improvements to the municipal power plant building under Contract 7, power wiring under Contract 8 and power piping under Contract 10 to Fred Krudwig, at $172,500. All bids received June 23 for Contract 2A, installing electric service entrances, were rejected; Burns & McDonnell Engineering Co., 95th St. & Troosts St., Kansas City, Mo., consulting engineer.

ST. LOUIS — American Packing Co., 3858 Garfield Ave., plans to build a $100,000 boiler house for meat packing plant.

NEW YORK

BROOKLYN, N. Y.—International Harvester Co., 180 N. Michigan Ave., Chicago, has awarded a $243,000 contract to Joseph L. Muscarelle Ltd., 42 First St., Hackensack, N. J., for construction of a truck garage, 71 Union Ave.; O. A. Krueger, c/o owner, architect.

OHIO

CLEVELAND — Meister Bros., 2044 Euclid Ave., plans to spend $175,000 on factory and office alterations, repairs, 1833 E. 21st St.; Jules Schwartz, 4501 Prospect Ave., consulting engineer.

CLEVELAND—The Texas Co., Box 5268, Indianapolis, will spend $1 million in construction of a terminal, 250 Mahoning Ave.

BOWERSTOWN, O.—Relocation of 11 miles of the Pennsylvania Railroad double track to eliminate the tunnel is under way at a cost of $3 million. This is scheduled for completion late next year.

McCONNELLSVILLE, O.—Ohio Power Co., 305 Cleveland Ave., S. W., Canton, O., will build a $36 million generating plant on site on Muskingum river, 12 miles south.

OKLAHOMA

OKLAHOMA CITY, OKLA.—T. G. & Y. Stores Co., 106 N. W. Eighth St., will build a $150,000 warehouse; plans by Coston & Frankfurt, Apco Tower.

OREGON

DALLES, OREG.—Midstate Construction Co. has low bid, $166,592, for construction of water filtration plant; G. D. Hall & Associates, Yakima, Wash., planning engineer.

PORTLAND, OREG.—Edgar F. Kaiser, president, Kaiser-Frazer Corp., announces installation in the immediate future of a $500,000 automobile assembly plant, following company's policy of decentralization. The program includes similar plants at other Pacific Coast centers.

PENNSYLVANIA

NEW CASTLE, PA.—Irvin Nixon, c/o New Castle Packing Co., will build a $250,000 meat packing plant.

SOUTH DAKOTA

SIOUX FALLS, S. DAK.—Sioux Valley Empire Electric Association, Colman, S. Dak., plans to build a $2.4 million power plant.

TENNESSEE

MEMPHIS, TENN.—International Harvester Co., 180 N. Michigan Ave., Chicago, has awarded a $1 million contract to William Culbreath Construction Co., Porter Bldg., for construction of a wholesale parts depot on a five acre plot on north side of Olive St., west of Arkansas St.

TEXAS

AUSTIN, TEX.—Von Boeck-Jones Co., 110 E. Ninth St., will build a $120,000 printing shop; Frank T. Drought, 117 W. Pecan St., San Antonio, Tex., mechanical engineer W. G. Darley, Nalle Bldg., electrical engineer.

CORPUS CHRISTI, TEX.—Producers Grain Corp., Amarillo, Tex., plans to build a $2 million grain elevator at Avery Turning Basin.

DALLAS—Lone Star Gas Co. has awarded a contract for $100,975 to Carpenter Bros., 1335 Plowman St., for an office building, Wood & Park Ave.; Mark Lemmon, 1210 Main St., architect.

HOUSTON—Hubbard Construction Co., c/o Russell W. Nix, 1507 Delano St., plans to build a $3 million truck terminal, Griggs Rd. & Wayside Dr.

McKINNEY, TEX.—W. B. Finney, Bakery Co., will build a $225,000 bakery; own forces.

PORT LAVACA, TEX.—Aluminum Co. of America, Fort Point, Tex., has awarded a $450,000 contract to Consolidated Western Constructors Inc. for construction of a power plant.

PROVIDENT CITY, TEX.—Shell Oil Co. Inc., Joe T. Dickerson, Houston, area manager, announces plans for a gasoline plant with gas-handling capacity of 60 million cu ft of gas daily, 75 miles southwest of Houston; plant expected to be in full operation by the summer of 1950; contract awarded to Fluor Corp. Ltd., Los Angeles.

WASHINGTON

OLYMPIA, WASH.—City will receive bids July 26 for proposed sewage pumping station, involving 12 tons reinforcing, a unit of $1 million project.

TACOMA, WASH.—Washington Hardware Co., 2159 Puyallup Ave., plans to build a $179,000 warehouse.

WEST VIRGINIA

MORGANTOWN, W. VA.—Trotter Coal Co., 157 Spruce St., plans to build a $100,000 coal cleaning plant, Bunker Mine.

WISCONSIN

ADAMS, WIS. — Regal Boat Co. plans to build a $115,000 boat manufacturing factory.

PRICES OF LEADING FERROALLOY PRODUCTS

(Continued from Page 147)

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Deliverd. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots 2" x D, $1.40 per lb of contained Ti; less ton $1.45, (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.28, less ton $1.35. F.o.b. Niagrara Falls, N. D., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract, $160 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 3-4.5%). Contract, $175 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

VANADIUM ALLOYS

Ferrovanadium: Open-Hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $2.90 per lb of contained Va. Deliverd. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.). $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.), $3.10.

Grainal: Vanadium Grainal No. 1, 93c; No. 6 63c; No. 79, 45c, freight allowed.

Vanadium Oxide: Contract, less carload lots, $1.20 per lb of contained V_2O_5, freight allowed. Spot, add 5c.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more. 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $6.25 per lb contained B, f.o.b. Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Contract, ton lot, 2" x D, $2.90 per lb of contained Cb, less ton $2.95. Delivered. Spot, add 25c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Carload, 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Carload packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, M 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 16.5c per lb of alloy, ton lots 17.50c, less ton 18.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.00c per lb of alloy; ton lots 18.00c; less ton lots 19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 11c, ton lots 11.25c, smaller lots 11.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); Gross tons per carload, f.o.b. sellers' works, Mt. Pleasant, or Siglo, Tenn.; $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth and Washington, Pa., furnace, any quantity $1.10.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth and Washington, Pa., packed in bags containing 20 lb of molybdenum, 95.00c.